



# **Douglas Partners**

*Geotechnics | Environment | Groundwater*

Report on  
Preliminary Site Investigation (Contamination)

Tuggerah Gateway Site  
60 Wyong Road, Tuggerah

Prepared for  
Scentre Limited

Project 202794.01  
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**Integrated Practical Solutions**





# Douglas Partners

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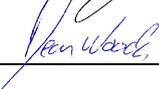
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## Executive Summary

Douglas Partners Pty Ltd (DP) has been engaged by Scentre Limited (Scentre) to complete this preliminary site investigation (contamination) (PSI) for the Tuggerah Gateway Site at 60 Wyong Road, Tuggerah (the site). The site is shown on Drawing 1, Appendix A.

It is understood that the site is proposed to be developed for mixed-use residential purposes comprising a mix of low and medium to high rise buildings. A number of internal roads and areas dedicated for open space / public domain are also proposed. The initial planning proposal seeks to rezone the portion of the site currently zoned RU6 Transition to R1 General Residential, with the remaining portions currently zoned B4 Mixed Use zone in the north-east of the site and E2 Environmental Conservation zone in the south-east is to be retained.

The objective of the PSI was to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or management with regard to the proposed development. It is understood that the report will be used initially to support a planning proposal and structure plan prepared by Urbis Pty Ltd (Urbis).

This PSI comprised a desktop review followed by a non-intrusive site walkover. DP considers that there is potential for contamination given the past site activities, past investigation results and the existing site conditions. Potential contamination sources were identified (refer to Table 6 – Section 8). The areas of environmental concern are identified in Drawing 1, Appendix A.

Notwithstanding, the site would generally be considered compatible (from a site contamination perspective) with the proposed mixed-use development, subject to the results of further intrusive contamination investigations to assess the site's contamination status and any requisite remediation works. On this basis, it is concluded that there are no significant site contamination constraints that would prevent the proposed rezoning. This conclusion is consistent the conclusions provided by previous reports by URS (2007) and Environ (2007).

It is recommended that a combined probabilistic and judgemental strategy should be adopted for the detailed site investigation (DSI) to substantiate DP's assessment of the contamination risk at the site. The DSI scope of work could be further developed during the preparation of a Sampling and Analysis Quality Plan (SAQP) with consideration given to the land uses proposed. It is anticipated that the recommended DSI and any remediation/validation works could be undertaken as a condition of the development (rezoning) approval, given the conclusions provided by URS (2007) and Environ (2007).

In addition to the recommendations provided above, previous investigations conducted by DP in the north-east portion of the site have confirmed the presence of acid sulfate in soils. These investigations should be extended to include the remaining portions of the site (i.e. areas mapped as alluvial soil). Notwithstanding, based on the previous investigation results, disturbance of site soils and sediments would need to be undertaken with reference to a site and development specific acid sulfate soil management plan (ASSMP).

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# Report on Preliminary Site Investigation (Contamination)

## Tuggerah Gateway Site

### 60 Wyong Road, Tuggerah

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## 1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by Scentre Limited (Scentre Group) to complete this preliminary site investigation (contamination) (PSI) for the Tuggerah Gateway Site at 60 Wyong Road, Tuggerah (the site). The site is shown on Drawing 1, Appendix A.

The investigation was undertaken with reference to DP proposal 202794.00.P.001.Rev0 dated 15 March 2021.

The objective of the PSI was to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or management with regard to the proposed development. On behalf of Scentre Group, this PSI supports a planning proposal and structure plan prepared by Urbis. The planning proposal facilitates the proposed amendment to the Local Environmental Plan at the Tuggerah Gateway Site, known as Lot 2 DP1056960 and Lot 3 DP1084221, which will enable residential, mixed-use and recreational land uses.

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

The PSI has been carried out concurrently with a preliminary geotechnical investigation that has been reported separately.

## 2. Proposed Development

The planning proposal seeks to rezone land comprising (part) Lot 2 in DP 1056960 and Lot 3 in DP 1084221 from RU6 Transition to R1 General Residential. The B4 Mixed Use zone in the north-east of the site and E2 Environmental Conservation zone in the south-east is to be retained. A number of internal roads and areas dedicated to open space / public domain are also proposed. The current concept plan for the proposed development is shown in Figure 1 below.



**Figure 1: Concept Plan**

### 3. Scope of Works

The scope of PSI work completed comprised:

- Collation and interpretation of readily available site data from the following sources:
  - o Published public data, including topographical, geological and hydrogeological maps;
  - o Registered groundwater bore licences;
  - o NSW EPA Contaminated Land and Protection of Environment Operations databases;
  - o Council Property Enquiry Information;
  - o Informal GIPA search request to Council;
  - o SafeWork NSW Storage of Hazardous Chemicals database;
  - o Historical aerial photographs;
  - o Historical title records; and
  - o Previous investigations and anecdotal information (where available).
- Site walkover to provide a visual assessment of potential contamination sources;
- Development of a preliminary Conceptual Site Model (CSM); and
- Preparation of this report outlining the works undertaken and the findings of the PSI.

#### 4. Site Information

Site Address	60 Wyong Road, Tuggerah
Legal Description	Lot 3 in DP 1084221 Lot 2 in DP 1056960
Area	Approximately 41.6 ha
Current Zoning	B4 Mixed Use Zone (north-east portion of the site) E2 Environmental Conservation (adjacent to the south-east boundary) RU6 Transition Zone (remaining portion of the site)
Local Council Area	Central Coast Council (CCC)
Current Use	Rural (grazing)
Surrounding Uses	North – Wyong Road and then bushland East – Tonkiss Street and then Westfield Tuggerah Shopping Centre or bushland South – Bushland West – Pacific Motorway (M1)
Site Coordinates	North-east corner: 351863mE 6313647mS South-east corner: 351836mE 6313172mS South-west corner: 351084mE 6313034mS North-west corner: 351320mE 6313688mS

An aerial view of the site is shown in Figure 2 below.



Figure 2: Aerial view of the site

## 5. Environmental Setting

### 5.1 Topography

Local topographical mapping suggests that surface levels at the site typically fall toward drainage gullies / intermittent watercourses within the site, and then to the north-east toward a tributary of Mardi Creek (within the site), which discharges to the northern side of Wyong Road. The mapping indicates that surface levels range from approximately RL 80 m AHD in the south-eastern corner of the site, to approximately RL 10 m AHD in the northern area of the site.

The site walkover suggested that the local natural topography has been modified for the construction of the Pacific Motorway and Wyong Road (i.e. the road corridors have been generally raised/filled). The site topography was also likely to have been modified by past land use activities (further details provided in Section 7). These suspected modifications included:

- large mounds of fill placed in the north-east corner of the site;
- several constructed ponds/dams;
- excavation/quarrying of the area adjacent to the southern site boundary; and
- benching or recontouring the hill slopes and excavation/filling of drainage gullies to control surface water runoff through the site.

## 5.2 Site Geology

The NSW Seamless Geology dataset, made available by the NSW Government Department of Regional New South Wales, has been referenced to determine the varying geology within the site.

Drawing 2 in Appendix A shows the mapped geology within the site. A summary of the expected geology is provided in Table 1 below.

**Table 1: Summary of Geological Units**

Unit ID	Unit Name	Unit Description
Tngb	Burralow Formation (aka Terrigal Formation)	Fine-grained, micaceous, quartz- to quartz-lithic sandstone; interbedded with siltstone, grey shale and red-brown claystone.
Tncp	Patonga Claystone	Red-brown claystone and siltstone, light green-grey fine-grained sandstone.
Q_av	Alluvial Valley Deposits	Silt, clay, (fluviially deposited) lithic to quartz-lithic sand, gravel.
QH_af	Alluvial Floodplain Deposits	Silt, very fine- to medium-grained lithic to quartz-rich sand, clay.

## 5.3 Soil Landscape

Reference has been made to the 1:100,000 scale soil landscape sheets for Gosford-Lake Macquarie to determine the varying soil landscapes at the site.

Drawing 3 in Appendix A shows the mapped soil landscape units within the site. A summary of the expected geology is provided in Table 2 below.

**Table 2: Summary of Geological Units**

Unit ID	Unit Name	Unit Description	Typical Limits / Hazards
Wn	Watagan (Colluvial)	Rolling to very steep hills on fine-grained Narrabeen Group sediments. Local relief 50-220 m, slopes >25%. Narrow convex crests and ridges, steep colluvial side slopes, occasional sandstone boulders and benches.	Mass movement hazard, steep slopes, soil erosion hazard, foundation hazard, occasional rock outcrop, seasonal waterlogging (localised).
Er	Erina (Erosional)	Undulation to rolling rises and low hills on the Terrigal Formation. Local relief <60 m, slopes <25%. Rounded narrow crests with moderately inclined slopes.	Mass movement (localised), high soil erosion hazard, foundation hazard (localised), localised high run-on, seasonal waterlogging of footslopes, strongly acid soils of low fertility.
Wo	Woodburys Bridge (Residual)	Gently undulating rises to rolling low hills on Patonga Claystone. Local relief 40-80 m and slope gradients up to 20%. Sandstone capping on crests of steeper hills is common. Predominantly cleared tall open-forest.	Extreme erosion hazard, high foundation hazard, seasonal waterlogging (localised), acid soils of very low fertility, low wet bearing strengths and high erodibility.
Wy	Wyong (Alluvial)	Broad poorly drained deltaic floodplains and alluvial flats of Quaternary sediments on the Central Coast Lowlands. Slope Gradients <3%; local relief <10m.	Flooding, seasonal waterlogging, foundation hazard, permanent waterlogging (localised), stream bank erosion (localised), acid sulfate potential (localised), strongly acid, poorly drained, impermeable soils of very low fertility with saline subsoils.

#### 5.4 Acid Sulfate Soils

Review of the local acid sulfate soil mapping indicates that the lower, northern area of the site is mapped as having a low probability of acid sulfate soils at depths greater than 3 m of the natural ground surface. Remaining areas of the site are mapped as having no known occurrence of acid sulfate soils.

Drawing 4 in Appendix A shows the mapped acid sulfate soil risk for the site.

## 5.5 Surface Water and Groundwater

Surface water would generally be expected to runoff toward drainage gullies / intermittent watercourses within the site, and then to the north-east toward a tributary of Mardi Creek (within the site), which discharges to the northern side of Wyong Road. Mardi Creek then discharges into Tuggerah Creek, Tuggerah Strict Nature Reserve (approximately 1.9 km north-east) and then Wyong River and Tuggerah Lake.

A search of the publicly available registered groundwater bore database indicated that there are two registered groundwater bores within 500 m of the site. A copy of the search results is provided in Appendix C. The two groundwater bores from within 500 m the site are summarised in Table 3.

**Table 3: Summary of Available Information from Nearby Registered Groundwater Bores**

<b>Bore ID Authorised Purpose Completion Year Status</b>	<b>Location Relative to Site</b>	<b>Final Depth (m)</b>	<b>Standing Water Level (m bgl)</b>
GW054807 Domestic / collapsed bore / 1981	150 m east	11.5	2.5
GW200520 Irrigation bore / test bore/ 2003	460 m east	61	4.0

With respect to the registered bores identified in Table 3, it is understood that both bores were located with the neighbouring Westfield Tuggerah Shopping Centre property. The centre was constructed in circa 1994, and therefore the bore installed prior to this time is unlikely to be operable.

Given the site's topography and geology, it is considered likely that a permanent groundwater table is present at relatively shallow depths (i.e. less than 1 – 2 m) within the alluvial soils in lower-lying portions of the site. For the higher elevation areas of the site, permanent shallow groundwater is likely to be encountered at deeper depths probably within the weathered rock profile. Intermittent seepage may however be encountered, at shallower depths, at localised permeability boundaries such as at the interface of filling and natural soils, sand and clay soils or at the weathered rock interface following periods of wet-weather. It should be noted that groundwater levels are potentially transient and can be affected by factors such as soil permeability and recent weather conditions.

Based on the local topography and the inferred flow direction of nearby water courses, the anticipated flow direction of groundwater beneath the site is to the north and east, towards Mardi Creek (within the site) and Tuggerah Creek (located on the north side of Wyong Road). These creeks and the Tuggerah Strict Nature Reserve are the likely receiving surface water bodies for the groundwater flow path. Given the local geology (i.e: Tuggerah Formation and Quaternary Alluvium), the groundwater is anticipated to be relatively fresh to slightly saline. Accordingly, potential beneficial uses could include irrigation or drinking water, although the future use of the groundwater for these purposes in the vicinity of the site is considered unlikely given the urban setting.

## **6. Site History**

### **6.1 Title Deeds**

A historical title deeds search was used to obtain ownership and occupancy information including company names and the occupations of individuals. The title information can assist in the identification of previous land uses by the company names or the site owners and can, therefore, assist in establishing whether there were potentially contaminating activities occurring at the site. A search of past registered proprietors of the site was completed for the URS (2007) report. The title deed information is presented in Appendix C. The summary provided by URS (2007) indicated that the site was owned by various individuals for agricultural purposes (i.e. butchers, dairymen, orchardists, etc) and that from the 1950's to the late 1980s, the site was used as an abattoir. The current owners of the site are Orta Pty Ltd (Lot 3 purchased in 1990) and Westfield Limited (Lot 2 purchased in 1992).

### **6.2 Historical Aerial Photography**

Several historical aerial photographs were obtained from public databases and licenced sources (i.e. metromap.com.au). Extracts of the aerial photographs are included in Appendix C. A summary of key features observed for the site and surrounding land is presented in Table 4.

**Table 4: Summary of Historical Aerial Photographs**

Year	Site	Surrounding Land Use
1954	<p>The site appeared to be generally vegetated with grass and some scattered trees. A suspected relatively small-scale abattoir (based on other historical information) appeared to be located centrally within the site consisting of several small to medium buildings. The site was accessed from Wyong Road (with Tonkiss Street not yet constructed). A possible residence and associated shed (Caretaker's House) was located in the south-east corner of the site. No other development activities were visible.</p>	<p>Wyong Road was visible, and the access road to the site followed part of the Tonkiss Street road reserve. The property to the east appeared to have a partial cropping or market garden usage. A relatively small area adjacent to the southern boundary may also have had a cropping or market garden usage. Some suspected orchard usage was suspected on a property on the western side of Old Maitland Road. Remaining surrounding areas appeared to comprise either bushland or a rural grazing usage.</p>
1966	<p>Abattoir operations appeared to have expanded, with some additional and larger buildings observed. Three dams were now visible, and the south-west portion of the site appeared to have been recontoured (possible series of trenches and mounds) to potentially control surface water runoff. No other significant changes were observed.</p>	<p>No significant changes were observed, other than a general decrease in intensive agricultural activities at nearby properties. Immediate surrounding properties appeared to comprise either bushland or a rural grazing usage.</p>
1975	<p>Abattoir operations appeared to have further expanded, with some additional and larger buildings observed. Some additional recontouring of surface levels in the southern and south-western areas were visible. Three new dams (suspected waste treatment ponds) were constructed or appeared to be under construction in the south-west portion of the site.</p>	<p>No significant changes were observed.</p>
1976	<p>No significant changes were observed, other than construction of the south-western most pond had continued. It is suspected that new construction works (i.e. a few new buildings/extensions) had resulted in excavated materials being regraded across the site (i.e. drainage depressions being infilled and some levelling of working areas) based on visible disturbance of surface vegetation.</p>	<p>No significant changes were observed.</p>
1980	<p>No significant changes were observed, other than some additional buildings associated with the abattoir had been constructed.</p>	<p>Pacific Motorway and Wyong Road appeared to be under construction or being upgraded.</p>

Year	Site	Surrounding Land Use
1985	No significant changes were observed, other than some additional buildings associated with the abattoir had been constructed.	Construction works associated with the Pacific Motorway and Wyong Road appeared to be completed. No intensive agricultural uses were evident on the surrounding properties.
1990	Abattoir operations appeared to have ceased and most/all of the buildings associated with the abattoir appeared to have been demolished. The building (suspected caretaker's house) located in the south-east corner was noted to have remained intact.	No significant changes were observed.
1994	All of the buildings associated with the abattoir had been demolished, and the area appeared to have a grass surface cover. The dams/ponds associated with the former abattoir appear to be largely intact. Suspected fill appears to have been imported to the north-east portion of the site most likely from the neighbouring Westfield Tuggerah Shopping Centre site (noted to be under construction at the time).	Westfield Tuggerah Shopping Centre and residential subdivisions appeared to be under construction to the east, north-east and south-east (respectively).
2004	No significant changes were observed. Close inspection of the aerial image identified a series of possible infilled trenches (darker strips) located centrally along the southern boundary. These features may suggest the presence of previous animal burial pits or other wastes.	No significant changes were observed.
2007	No significant changes were observed.	No significant changes were observed, other than Tonkiss Street had now been constructed adjacent to the eastern site boundary.
2016	No significant changes were observed, other than an area of trees positioned centrally along the eastern boundary had been removed and surface vegetation disturbed.	No significant changes were observed.
2019	No significant changes were observed, other than the suspected caretaker's house appeared to have been demolished, although some remnant materials or stockpiles were visible.	No significant changes were observed.

### 6.3 Public Registers and Planning Records

EPA Notices available under Section 58 of the Contaminated Lands Management Act (CLM Act)  Database searched 19 April 2021	There were no records of notices for the site or adjacent sites.
Sites notified to EPA under Section 60 of the CLM Act  Database searched 19 April 2021	The site was listed as a notified contaminated site and management class is listed as under assessment.
Licences listed under Section 308 of the Protection of the Environment Operations Act 1997 (POEO Act)  Database searched 19 April 2021	There were no records issued to the site or adjacent sites.
SafeWork NSW  Searched Results 22 April 2021	There were no records issued to the site.
Council Records  Database searched 24 March 2021	<p>Lot 2 - Applications lodged:</p> <ul style="list-style-type: none"> <li>- Three lot subdivision (refused on 19 May 2016).</li> </ul> <p>Lot 3 - Applications lodged:</p> <ul style="list-style-type: none"> <li>- Hardware and building supplies development including associated site works (Masters Homemaker Improvement Centre) (approved on 19 November 2015). This development was not constructed.</li> </ul>
Informal Information Access Request  Database searched 19 April 2021	<p>Identified:</p> <ul style="list-style-type: none"> <li>- Stage 1 and Limited Stage 2 Environmental Site Assessment, Tuggerah Gateway Site , Tuggerah (URS, 2007).</li> </ul>

### 6.4 Previous Reports

As part of the site history review, DP was provided with a copy of the following two reports:

- URS Australia Pty Ltd (URS), *Stage 1 and Limited Stage 2 Environmental Site Assessment, Tuggerah Gateway Site, Tuggerah*, Ref 43187208, dated 9 February 2007 (URS, 2007); and
- Environ Australia Pty Ltd (Environ), *Interim Advice – Review of Environmental Works, Tuggerah Gateway*, Ref 31-0625, dated 22 March 2007 (Environ, 2007).

DP has also undertaken the following previous investigations/reports within the site:

- Douglas Partners Pty Ltd, *Report on Acid Sulfate Soil Assessment, Proposed Bulky Goods Development, Tuggerah Gateway Project (Phase 1), Wyong Road Tuggerah*, Ref 75905.00, dated 29 January 2015 (DP, 2015a);
- Douglas Partners Pty Ltd, *Report on Acid Sulfate Soil Management Plan, Proposed Bulky Goods Development, Tuggerah Gateway Project (Phase 1), Wyong Road Tuggerah*, Ref 75905.00, dated 29 January 2015 (DP, 2015b); and
- Douglas Partners Pty Ltd, *No Formal Report Prepared [Factual Information Only – Borehole and Testpit Logs only]*, Ref 75905.01, dated July 2016;

DP investigations/reports targeted the north-east portion of the site, and was undertaken as part of a proposed bulky goods development that did not proceed.

The following sub-sections provide a summary (extracts) of these reports.

#### **6.4.1 URS (2007)**

URS completed a Stage 1 and Limited Stage 2 Environmental Site Assessment (ESA) of the site. The ESA was prepared to support a development application for rezoning of the site for mixed medium density residential, commercial and open space land uses. The ESA was based on a desktop review of available information, a search of historical records and aerial photographs, a site walkover inspection and limited grid-based intrusive investigations involving soil sampling.

In 2007, the site was described as being unoccupied and was leased for cattle grazing. Prior to being used for cattle grazing, the site was an abattoir. Abattoir infrastructure was demolished leaving some demolition rubble (circa 1990). Potential on-site sources of soil contamination identified during the Stage 1 assessment include the following:

- Past operations of the abattoir including detection of phenols and cresols in the water and sediment of the dams on site during past environmental investigations;
- Asbestos fragments from the demolition of the abattoir;
- The large stockpile located in the north-east corner of the site and other fill located directly south of this stockpile. It is understood that this fill originated from the construction of the Westfield Tuggerah Shopping Centre located on the eastern side of Tonkiss Street;
- Two smaller stockpiles of fill located to the east of the former abattoir site. The origin of this fill is unknown; and
- Potential for acid sulfate soil conditions in low lying areas of the site.

The Stage 2 intrusive investigation involved collection of representative samples from the former abattoir site, the large stockpile located in the north-east corner, the fill located directly to the south of the stockpile and from the dams/treatment ponds. The remainder of the site was also sampled to provide a spatial representation of the soil condition on site. The Stage 2 works included the sampling of 27 test pits in the former abattoir area, eight test pits in the large stockpile, three test pits in the fill to the south of the large stockpile, five test pits in the dry dam and 26 boreholes from the remainder of the site.

Three samples of surface water were also taken. Selected samples were analysed for metals, total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), asbestos and acid sulfate indicators in accordance with a draft Sampling and Analysis Plan prepared by URS.

Exceedances of ANZECC 2000 water quality guidelines for total metals were detected in samples from Dams 1 and 2. Remnant piping containing asbestos was identified on one location on the site and asbestos fibres were detected in soil at one surface sample location. Overall, URS considered that it appears the asbestos remediation reportedly undertaken by New Environment in 1994 had been completed satisfactorily. The implementation of an Unexpected Finds Protocol during site development was recommended by URS in the event of discovery of potential contamination.

Sampling by URS detected low concentrations of 2-4-dichlorophenol in sediment and low concentrations of 2-methylphenol and 3-4-methylphenol detected in residual water from Dam 1. Whilst guidelines do not exist for these compounds, URS' opinion was that the concentrations of these compounds were sufficiently low as to not be considered of risk to human health or the environment.

Detection of TPH at one location was not considered significant as the detection was isolated and of moderate concentration only.

Fill containing anthropogenic materials was identified located adjacent to the existing Tonkiss Street entrance. No chemical contamination was reported.

The existence of actual and potential acid sulfate soil conditions was identified in low-lying areas of the site.

Based on the results of historic investigations and their Environmental Site Assessment, URS considered that there was no constraint to rezoning of the Tuggerah Gateway site for the proposed medium density residential, commercial/industrial and open space land uses resulting from land contamination has been identified, subject to:

- Preparation and implementation of an Acid Sulfate Management Plan during disturbance of soils in low lying areas of the site;
- Removal and appropriate disposal of asbestos containing materials (pipe) identified on the site;
- Appropriate management of the fill containing anthropogenic materials located adjacent to the existing Tonkiss Street entrance;
- If required, additional validation sampling and reporting to the satisfaction of a NSW DEC (now EPA) accredited Site Auditor prior to issue of construction development consent for nominated areas of the site; and
- Adoption of an Unexpected Finds Protocol (UFP) during site development works describing management responses in the event of discovery of potential contamination.

URS recommended that the above works should be undertaken prior to the commencement of bulk earthworks.

It should be noted that the URS (2007) investigation was completed prior to the introduction of NEPC (2013), and on this basis the conclusions made by URS may not be consistent with current NSW EPA endorsed guidelines.

### 6.4.2 Environ (2007)

Graeme Nyland (acting in the role of NSW DEC (now NSW EPA) Accredited Contaminated Site Auditor) prepared the interim letter to provide an independent review of the contamination status of the Tuggerah Gateway site, Tuggerah. It was understood that the review was required in relation to a proposed rezoning (circa 2007). The interim advice noted that several individual contamination investigations and documents have been prepared for the site, dating back to circa 1993. These documents were not made available to DP for this PSI, however, were reviewed by URS (2007) and Environ (2007).

The following is a summary of site historical information provided by Environ (2007), that was obtained from the URS (2007) report:

- The review indicates that the site has mainly been under private ownership since 1921 and used for the purposes of agricultural activities. Proprietors have included butchers, dairymen, orchardists and various other farming related businesses;
- The exception was the ownership of one portion of the site (i.e. Lot 3) by Wyong Abattoirs Pty Ltd between 1960 and 1985. Aerial photographs indicate that the construction of the abattoir had commenced by 1954. A third-party report indicated that the abattoir activities ceased in 1989, when all associated buildings were demolished. The report indicated that activities included stock transfer, meat processing and packaging, skin drying (air drying only), heat generation and water treatment. The report states that there were three former underground storage tanks (USTs) (south of Building E). Information relating to the size of the USTs, when they were installed or what was stored in them was not provided. USTs were reportedly removed during demolition works and were backfilled with clean soil. No known soil testing or decommissioning has been undertaken; and
- Other developments identifiable across the site seem to be predominantly rural-related, with increasing clearing of tree cover and some unsealed access tracks. By the time of the 1994 aerial photograph, the large stockpile in the north-eastern corner was visible and coincided with the commencement of the Westfield Tuggerah Shopping Centre to the east of the site.

The auditor commented that the site history provided an adequate indication of past activities. The Auditor was also satisfied past uses that have the potential to have contaminated the site had been identified through the historic search.

The following additional site historical information was summarised in the Environ (2007) report and was sourced from the historical reports prepared for the site:

- An interview with a former abattoir employee, whose father reportedly had also worked for the abattoir (October 1994). The abattoir had reportedly been operating as a slaughterhouse since the beginning of the 1900's. Pigs were farmed until the mid-1950s and were fed the boiled-up bones and scraps from the slaughtered sheep and cattle. Trenches were dug for blood, which were subsequently filled in. Waste products (such as stomachs) were ploughed into the soil or fed to pigs. The report indicated that microbial contamination is unlikely to be a concern, as no disposal activities have been undertaken since the end of the 1960s. In more recent times the blood, intestines and other waste were processed into a blood and bone product. Skin sheds were constructed for the air-drying of hides, with no chemical tanning activities reportedly undertaken (URS email 30 January 2007).

- The four water treatment dams were constructed for treating wastewater associated with the cleaning of the abattoir. Dam 1 was the inlet dam closest to the abattoir which sequentially had led to Dams 2, 3 and 4 (depicted in New Environment letter report dated 8 March 1995). The auditor stated that it is unclear exactly what works have been undertaken and what state the dams are currently in (circa 2007).

The auditor also provided an evaluation of Limited Stage 2 sampling and analysis completed by URS (2007) and concluded that the data from the URS investigation was likely to be reliable and is useable for the purpose of the review. Notwithstanding, the following limitations pertaining to the URS (2007) report were identified by Environ (2007):

- Sampling density across the site was lower than the minimum recommended for hotspot detection in the NSW EPA (1995) 'Sampling Design Guidelines';
- Only a few borehole logs were provided, so it was not possible to assess whether adequate or representative analysis had been undertaken on the various materials encountered across the site. It seemed that no analysis has been undertaken on layers that included cow remains or significant amounts of charcoal;
- URS (2007) made insufficient reference to the earlier SK investigation and did not undertake further sampling or analysis to address areas of potential contamination that were identified by SK, such as validation of the former UST area or undertaking TPH analysis on dam sediments based on strong hydrocarbon odours that were identified;
- Photoionisation Detector (PID) screening procedures not provided; and
- The SK investigation (1993) had numerous limitations and Environ (2007) considered that the results can only be considered as indicative.

Based on the review completed, Environ (2007) agreed with conclusion made by URS that the site can be made suitable for the proposed uses. However, some sections of the site have uncertainties associated with them and have not yet been adequately validated to ensure suitability for residential land use. It was recommended that some issues should be assessed prior to development works. Areas that are considered to require further investigation (by Environ 2007) are listed below:

- Former UST area;
- Unknown nature of fill material beneath the abattoir portion of the site, including the extent of cow remains. Based on the interview with the former employee, it seems that trenches were constructed which were filled with carcass waste products that were subsequently backfilled. As partially undecomposed cow remains were identified during the URS fieldworks (at depths greater than 1 m) it is considered that the low-lying areas around the abattoir site should be investigated and recommendations made in terms of requirements for remediation and/or suitability for residential land use;
- Possible TPH, cresol and phenol contamination associated with the four sequential treatment dams require further assessment. There were also some uncertainties associated with the two other dams identified across the site. Sampling of sediment from all dams would also provide an indication of any historical pesticide use on the site;
- Details of historic asbestos removal works were uncertain. It was considered that a comprehensive surface walkover inspection of the abattoir area should be undertaken by appropriately trained asbestos personnel;

- Given the considerable size of the stockpile in the north-eastern corner of the site and that none of the URS sampling locations seem to have been extended through the entire depth of fill, additional characterisation works should be undertaken to confirm the status of the material. Recommendations as to the suitability of the material to remain on-site should be made;
- Similarly, the fill material to the south of the stockpile has not been adequately characterised to date. Given the area of fill and a depth of approximately 3 m, it was considered that additional investigations were required to allow for proper assessment in terms of site suitability or future management; and
- In terms of the various mounds, embankments, terracing and modified creeks across the site, it needs to be demonstrated that sampling is representative of these modified landscapes and that they represent uncontaminated material. Sampling locations, past and future, should be related to site features and former features on an appropriately scaled site plan.

Environ (2007) concluded that following this further assessment, it is considered that any remaining uncertainties could be managed with an UFP (as recommended by URS (2007)).

#### **6.4.1 DP (2015a, 2015b and 2016)**

DP's investigations comprised an assessment of acid sulfate soil conditions in the north-east portion of the site and targeted the existing large stockpile and nearby natural soils.

A brief summary of the relevant conditions encountered previously is provided below in Table 5.

**Table 5: Summary of Relevant Previous Investigations Undertaken by DP**

Project No.	Location	Type of Investigation	Summary Subsurface Conditions
DP (2015a) and DP 2015b) 75905.00	North-eastern area of site Large stockpile and surrounds	Acid sulfate soil assessment – boreholes	<p>Stockpile fill material comprised a mix of sand, silt and clay soils to depths up to approximately 10.5 m. Natural alluvial soils below comprised 0.5 m to 1.0 m layer of clayey / sandy silt, underlain by silty sandy clay or clay.</p> <p>Free groundwater was observed at about RL 6 m AHD in one of the boreholes, however, this appeared to be coincidental with a sandy layer and may represent a seepage path rather than true groundwater. Groundwater / leachate was also measured at 6.5 m depth in an existing well installed within the stockpiled material. No free groundwater was observed in the remaining bores, which were drilled to deepest RL 4.9 m AHD.</p> <p>Both acid sulfate soils and acidic soils were found to present in this area of the site and an acid sulfate soil management plan was prepared.</p>
75905.01	North-eastern area of site Large stockpiles and surrounds	Subsurface conditions (factual) – boreholes and test pits	<p>Boreholes drilled to north of large stockpile comprised weak sandy and silty clay soils to RL 2.5 m to 7 m AHD. Weak soils typically underlain by stiff or stronger clay soils or at least medium dense sands.</p> <p>Test pits excavated on the southern side of stockpile generally comprised relatively shallow (up to ~1m) weak sandy or silty soils underlain by stiff or stronger clay soils. Fill material with building waste was encountered in some pits.</p> <p>Free groundwater was observed near the ground surface during drilling of the bores north of the large stockpile. Groundwater seepage was also observed within the fill material or in sandy layers at other locations within 1 m to 2 m of the ground surface.</p>

## 6.5 Site History Integrity Assessment

The information used to establish the history of the site was sourced from reputable and reliable reference documents, many of which were official records held by Government departments/agencies. The databases maintained by various Government agencies potentially can contain high quality information, but some of these do not contain any data at all.

In particular, aerial photographs provide high quality information that is generally independent of memory or documentation. They are only available at intervals of several years, so some gaps exist in the information from this source. The observed site features are open to different interpretations and can be affected by the time of day and/or year at which they were taken, as well as specific events, such as flooding. Care has been taken to consider different possible interpretations of aerial photographs and to consider them in conjunction with other lines of evidence.

## 6.6 Summary of Site History

The historical information suggests that the site was operated as an abattoir since the early 1900's, however, other agricultural uses (i.e. dairy and orchards – as suggested by the historical titles) cannot be ruled out prior to 1954. Historical aerial photographs also suggest that the scale of abattoir operations increased from the 1950's to the 1980's, and then prior 1990, operations ceased, and all buildings were demolished.

Historical aerial photographs suggest that fill materials were imported to site (circa 1994) and placed in two stockpiles in the north-east portion of the site. It is likely that these materials were originally excavated from the nearby Westfield Tuggerah Shopping Centre site. Since the late 1990s, it is likely that the site has remained relatively unchanged being primarily utilised for a grazing use. Historical aerial photographs suggest that circa 2016, some trees were cleared and possibly stockpiles were spread in the central eastern portion of the site and the former caretaker's residence (south-east) was demolished.

## 7. Site Walkover

A site walkover was undertaken by an environmental engineer on 24 April 2021. The general site topography was consistent with that described in Section 5.1. The site layout appeared to have remained unchanged from the 2019 aerial photograph. It should be noted that much of the site was vegetated with a dense vegetation (i.e. grass cover or bush regrowth), which prevented adequate visual inspection of surface soils (in most areas). The following key site features pertinent to the PSI were observed (refer to photographs in Appendix D):

**Table 6: Summary of Pertinent Site Feature Identified During Site Walkover by DP**

Area / Issue	Location	Observations
Former Abattoir	Central eastern portion	<p>Evidence of the former abattoir activities comprised modification (regrading) of the natural topography, scattered building demolition materials (mainly comprising concrete, brick, metal) observed at the ground surface and in relatively small stockpiles. No evidence of a former UST or AST area was identified. Some significant observations included:</p> <p>Photo 70 – a suspected asbestos-containing-material (ACM) pipe at the ground surface (consistent with a pipe identified by URS (2007)).</p> <p>Photo 90 – a suspected ACM fragment at the ground surface.</p> <p>Photo 97 – two suspected septic tanks (in-ground concrete tanks) suspected to be associated with the former abattoir activities.</p> <p>Photo 113 – an example of concrete, brick and metal debris scattered at the ground surface and in relatively small stockpiles (partly overgrown with vegetation).</p>
Former Effluent Treatment Ponds	Central south and south-west portion of the site.	<p>The former effluent treatment ponds comprised four ponds/dams. The western two ponds were dry with grass in the base and the eastern two ponds contained some water (likely shallow depth) and the base was vegetated with reeds. Numerous mounds of suspected fill surrounded the ponds/dams. Some significant observation included:</p> <p>Photo 44 – western most pond, with the surrounding bund/mound.</p> <p>Photo 51 – remnant pumping/aeration infrastructure left in the former effluent treatment pond.</p> <p>Photo 55 – eastern most pond, vegetated with reeds and mounds of suspected fill in the locality of the ponds.</p>
Possible Burial Pits	Central south portion of the site.	<p>The presence/absence of animal burial area could not be confirmed from a review of the background information. However, an area suspected to have been covered by numerous possibly infilled trenched excavations was identified in the historical aerial photographs. Walkover observed irregular surface conditions with long dense grass vegetation (refer to Photos 49 and 50).</p>
Other Dams and intermittent drainage alignments	Throughout the site	<p>Two small dams were identified, with both contained water. Site observations indicated that surface water runoff was concentrated in several intermittent creeks or drainage depressions (water was generally flowing through the watercourses at the time of the walkover), and the waterlogged area (central north-west area). Water was flowing to the north and east to discharge off-site in the north-east corner of the site through drainage culverts (refer to Photos 9, 30 and 40).</p>

Area / Issue	Location	Observations
Large Stockpiles	North-east portion of the site	<p>A large grass covered stockpile was observed within the north-east corner the site (refer to Photo 1). The stockpile was estimated to be up to 10 m high with dimensions of approximately 225 m by 70 m. Walkover did not identify any anthropogenic materials at the surface of the stockpile (noting that grass surface cover prevented adequate visual inspection). A second large stockpile was observed to the south of largest stockpile (refer to Photo 9). The stockpile was estimated to be up to 3 m high with dimensions of approximately 130 m by 50 m. Walkover identified concrete and steel at the surface of the stockpile (noting that the grass surface cover prevented adequate visual inspection).</p> <p>Several other smaller stockpiles/mounds of suspected soils were identified at the site. These piles had a grass surface cover that prevented adequate visual inspection.</p>
Former Caretakers House	South-east portion of the site	<p>Inspection in the locality of the former caretaker's house (building) indicated that some remnant building materials were still scattered in the area. Several relatively small stockpiles/mounds of soils (some roadbase fill) were identified with concrete inclusions (refer to Photos 33, 51 and 63). Most of the stockpiles had a grass surface cover that prevented adequate visual inspection.</p>
Areas subject to recontouring / mounds etc	Majority of the site	<p>The natural surface levels across the site appeared to be modified (terraced, recontoured, cut and filled) probably primarily to manage surface water runoff (refer to Photos 33, 51 and 63). Numerous areas were affected including the hill slopes and drainage alignments. These areas had a grass surface cover prevented adequate visual inspection.</p>

## 8. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e.: it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

### 8.1 Potential Sources

Based on the current investigation, the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified.

- S1: Fill: Associated with levelling, imported fill stockpiles, site recontouring, demolition of former buildings on the site.
  - o COPC include metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), phenols and asbestos.
- S2: USTs/ASTs and associated pipework and bowsers.
  - o COPC include lead, TRH, BTEX, PAH.
- S3: Former buildings (Abattoir and Caretakers House).
  - o COPC include asbestos, synthetic mineral fibres (SMF), lead (in paint) and PCB.
- S4: Effluent Treatment Ponds.
  - o COPC include metals, TRH, BTEX, PAH, phenols (including cresols), microbiological contaminants (e.g. faecal coliforms and salmonella) and nutrients.
- S5: Possible Animal Burial Areas.
  - o COPC include visual and olfactory issues and microbiological contaminants (e.g. faecal coliforms and salmonella) and nutrients.
- S6: Past agricultural uses.
  - o COPC include metals and OCPs.

### 8.2 Potential Receptors

The following potential human receptors have been identified:

- R1: Construction and maintenance workers;
- R2: End users [mixed-uses including residential]; and
- R3: Adjacent site users [residential and commercial].

The following potential environmental receptors have been identified:

- R4: Surface water [Mardi Creek and Tuggerah Creek (freshwater)];
- R5: Groundwater; and
- R6: Terrestrial ecology.

### 8.3 Potential Pathways

The following potential pathways have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of dust and/or vapours;
- P3: Surface water run-off;
- P4: Lateral migration of groundwater providing base flow to water bodies;
- P5: Leaching of contaminants and vertical migration into groundwater; and
- P6: Contact with terrestrial ecology.

### 8.4 Summary of Potentially Complete Exposure Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S6) and receptors (R1 to R6) are provided in Table 6.

**Table 6: Summary of Potentially Complete Exposure Pathways**

Source and COPC	Transport Pathway	Receptor	Risk Management Action
S1: Fill, Metals, TRH, BTEX, PAH, OCP, PBC and asbestos S2: USTs/ASTs, Lead, TRH, BTEX, PAH S3: Former buildings, asbestos, SMF, lead and PCB S4: Effluent Treatment Ponds, metals, TRH, BTEX, PAH, phenols, microbiological contaminants and nutrients S5: Possible Animal Burial Areas, visual and olfactory issues, microbiological contaminants and nutrients S6: Past agricultural uses, metals and OCPs.	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours P3: Surface water run-off P4: Lateral migration of groundwater providing base flow to water bodies P5: Leaching of contaminants and vertical migration into groundwater P6: Contact with terrestrial ecology	R1: Construction and maintenance workers R2: End users [mixed-uses including residential] R3: Adjacent site users [residential and commercial] R4: Surface water [Mardi Creek and Tuggerah Creek (freshwater)] R5: Groundwater R6: Terrestrial ecology	<p style="text-align: center;">An additional intrusive investigation is recommended to assess possible contamination including testing of the soils, sediments, surface water and groundwater.</p>

## 8.5 Data Gaps

On the basis of the information presented in this PSI report, some data gaps have been identified. This conclusion is consistent with comment made in the Environ (2007) report. Further intrusive investigation is recommended to assess possible contamination including testing of the soils, sediments, surface water and groundwater. Specifically, with respect to the location of former refuelling infrastructure (i.e. location of USTs/ASTs) it would be beneficial if historical documentation/reports could be reviewed to ascertain the locality of the former infrastructure (i.e. Contamination Investigation (Sinclair Knight – 1993) that was referenced in Environ (2007). These investigations could be undertaken at a later stage of the development approval process (i.e. as a condition of the development (rezoning) approval).

## 9. Conclusions and Recommendations

Douglas Partners conducted a PSI for the Tuggerah Gateway Site, located at 60 Wyong Road, Tuggerah. The objective of the investigation was to provide an initial (updated) assessment of the likely compatibility of the site for urban development with regard to site contamination and acid sulfate soils. The land uses proposed are understood to include a mix of residential, commercial and recreational uses with interconnecting roads and infrastructure. This PSI will be used initially to support the land rezoning application.

Based on the findings of the desktop review and site walkover, DP considers that there is potential for contamination given the past site activities, past investigation results and the existing site conditions. Potential contamination sources were identified (refer to Table 6 – Section 8). The areas of environmental concern are identified in Drawing 1, Appendix A.

Notwithstanding, the site would generally be considered compatible (from a site contamination perspective) with the proposed mixed-use development, subject to the results of further intrusive contamination investigations to assess the site's contamination status and any requisite remediation works.

On this basis, it is concluded that there are no significant site contamination constraints that would prevent the proposed rezoning. This conclusion is consistent the conclusions provided by previous reports by URS (2007) and Environ (2007).

It is recommended that a combined probabilistic and judgemental strategy should be adopted for the detailed site investigation (DSI) to substantiate DP's assessment of the contamination risk at the site. The DSI scope of work could be further developed during the preparation of a Sampling and Analysis Quality Plan (SAQP) with consideration given to the land uses proposed. It is anticipated that the recommended DSI and any remediation/validation works could be undertaken as a condition of the development (rezoning) approval, given the conclusions provided by URS (2007) and Environ (2007).

In addition to the recommendations provided above, previous investigations conducted by DP in the north-east portion of the site have confirmed the presence of acid sulfate in soils. These investigations should be extended to include the remaining portions of the site (i.e. areas mapped as alluvial soil). Notwithstanding, based on the previous investigation results, disturbance of site soils and sediments would need to be undertaken with reference to a site and development specific acid sulfate soil management plan (ASSMP).

## 10. References

- DP. (2015a). *Report on Acid Sulfate Soil Assessment, Proposed Bulky Goods Development, Tuggerah Gateway Project (Phase 1), Wyong Road Tuggerah*. Ref 75905.00: Douglas Partners Pty Ltd.
- DP. (2015b). *Report on Acid Sulfate Soil Management Plan, Proposed Bulky Goods Development, Tuggerah Gateway Project (Phase 1), Wyong Road Tuggerah*. Ref 75905.00: Douglas Partners Pty Ltd.
- Environ. (2007). *Interim Advice – Review of Environmental Works, Tuggerah Gateway*. Ref 31-0625: Environ Australia Pty Ltd.
- NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.
- NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.
- URS. (2007). *Stage 1 and Limited Stage 2 Environmental Site Assessment, Tuggerah Gateway Site, Tuggerah*. Ref 43187208: URS Australia Pty Ltd.

## 11. Limitations

Douglas Partners (DP) has prepared this report for this project at 60 Wyong Road, Tuggerah in accordance with DP's proposal 202794.00.P.001.Rev0 dated 15 March 2021 and acceptance received from Adam Achterstraat of Scentre Limited dated 7 April 2021. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Scentre Limited for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The interpretation and advice provided is of a general nature only and is based upon the conditions indicated by published maps and encountered during past investigations. The accuracy of the advice provided by DP in this report may be affected by undetected variations in the ground conditions along the alignment, which can change abruptly due to variable geological processes and also as a result of human influences.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

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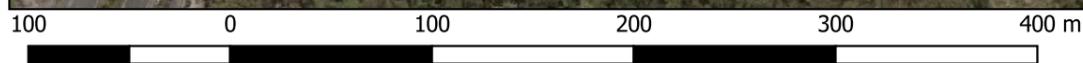
**Douglas Partners Pty Ltd**

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## Appendix A

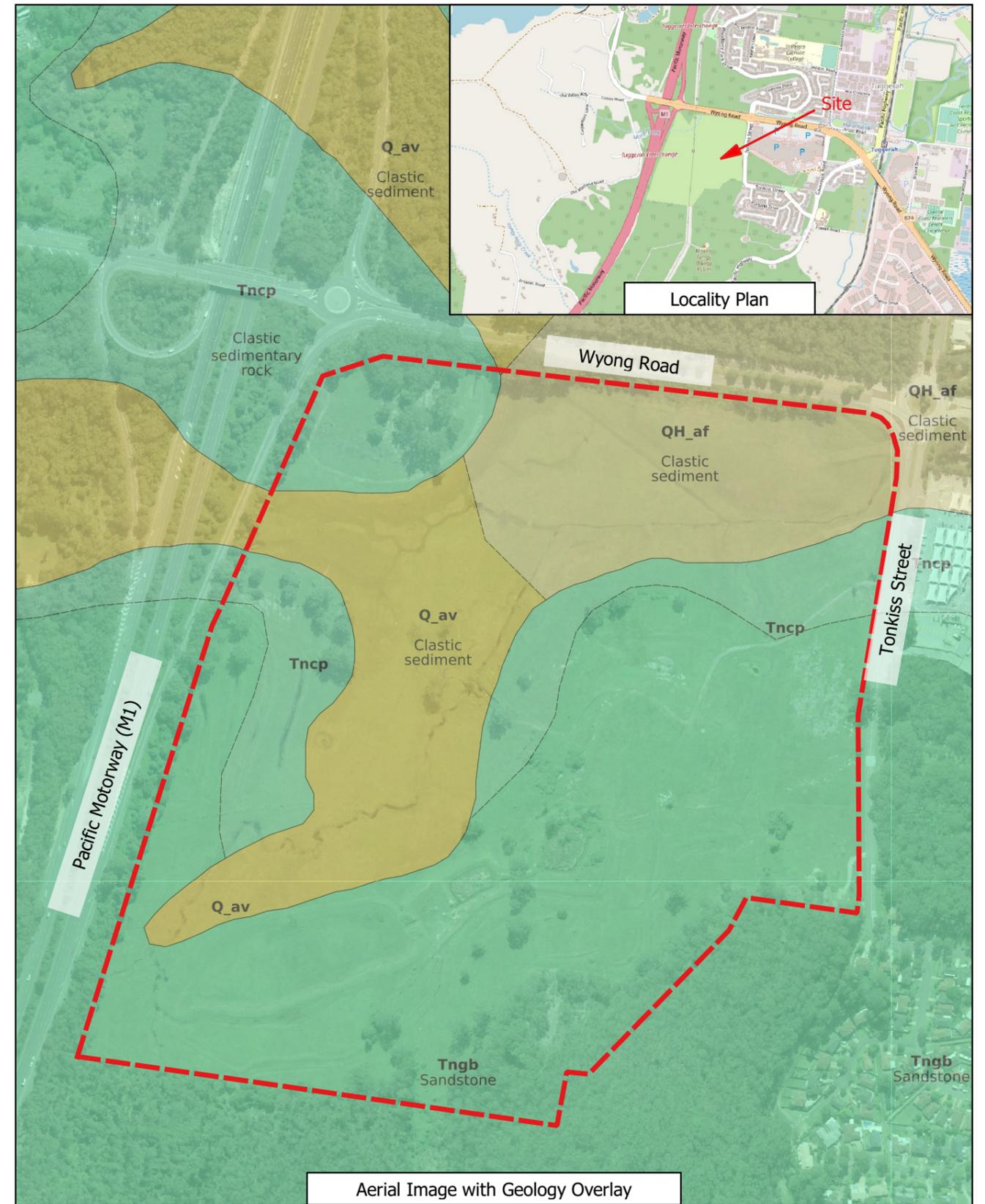
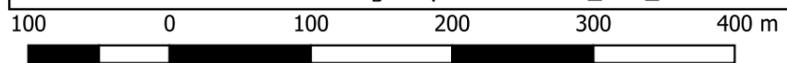
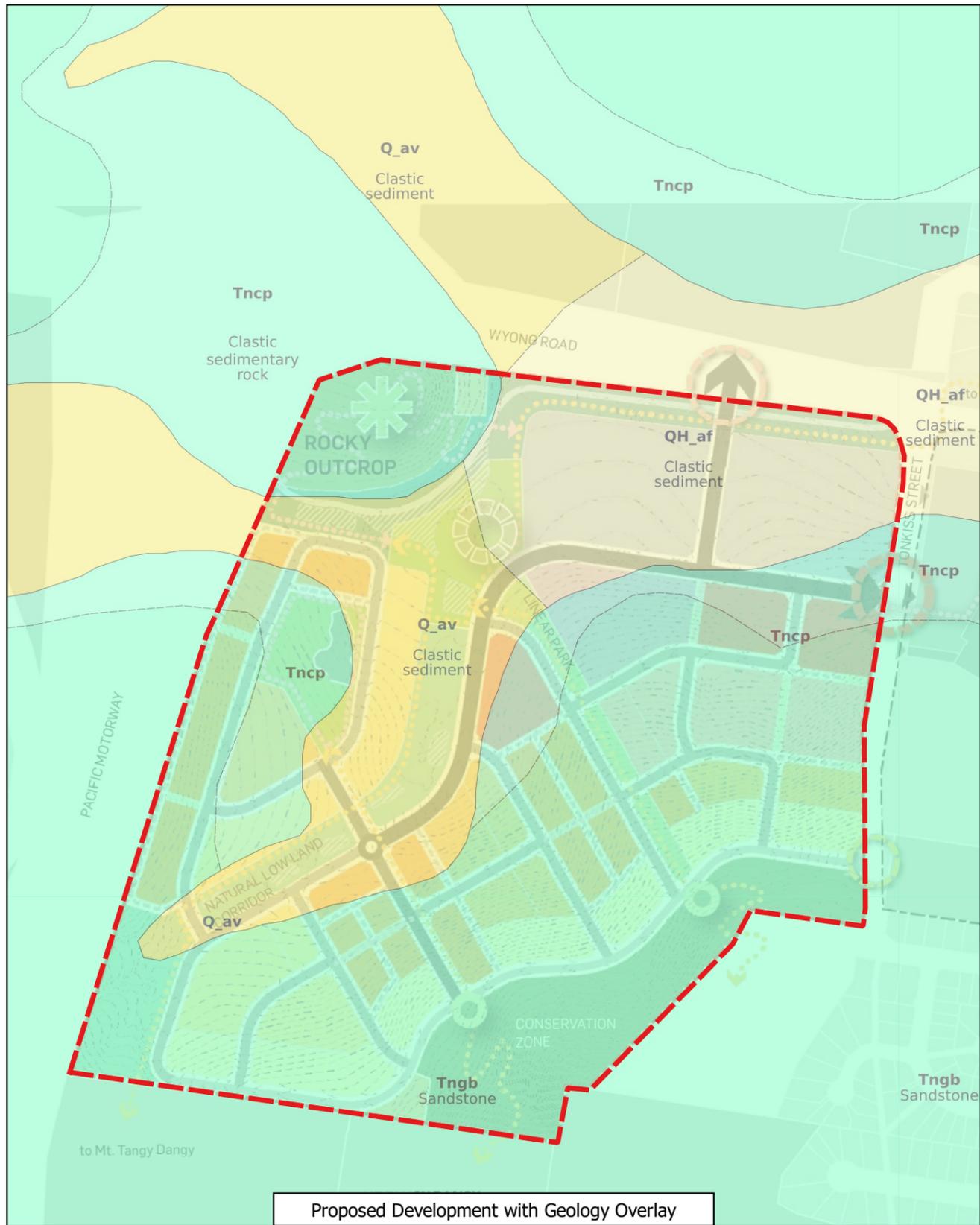
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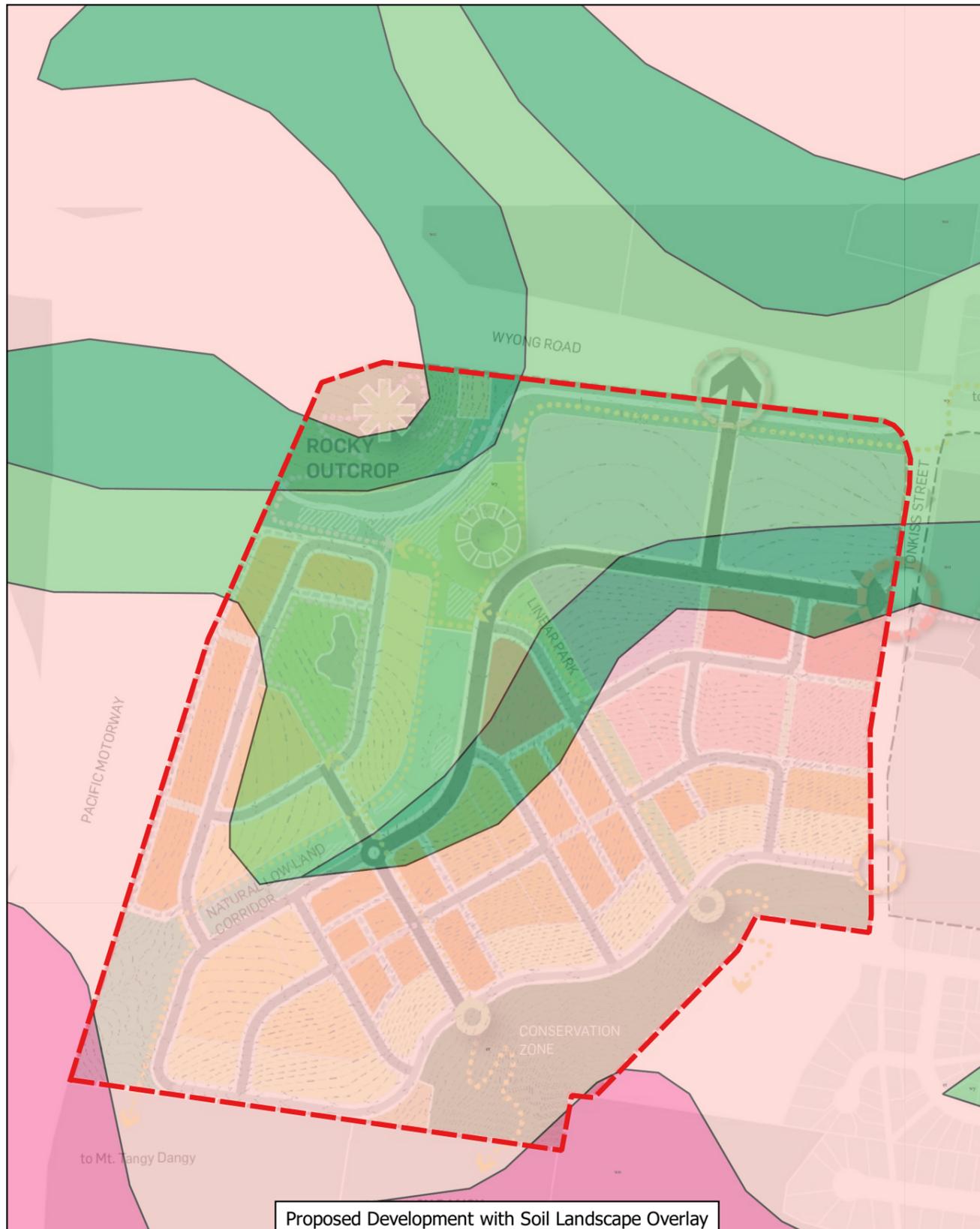
Drawings



Drawing adapted from Metromap Image, dated 6 April 2020

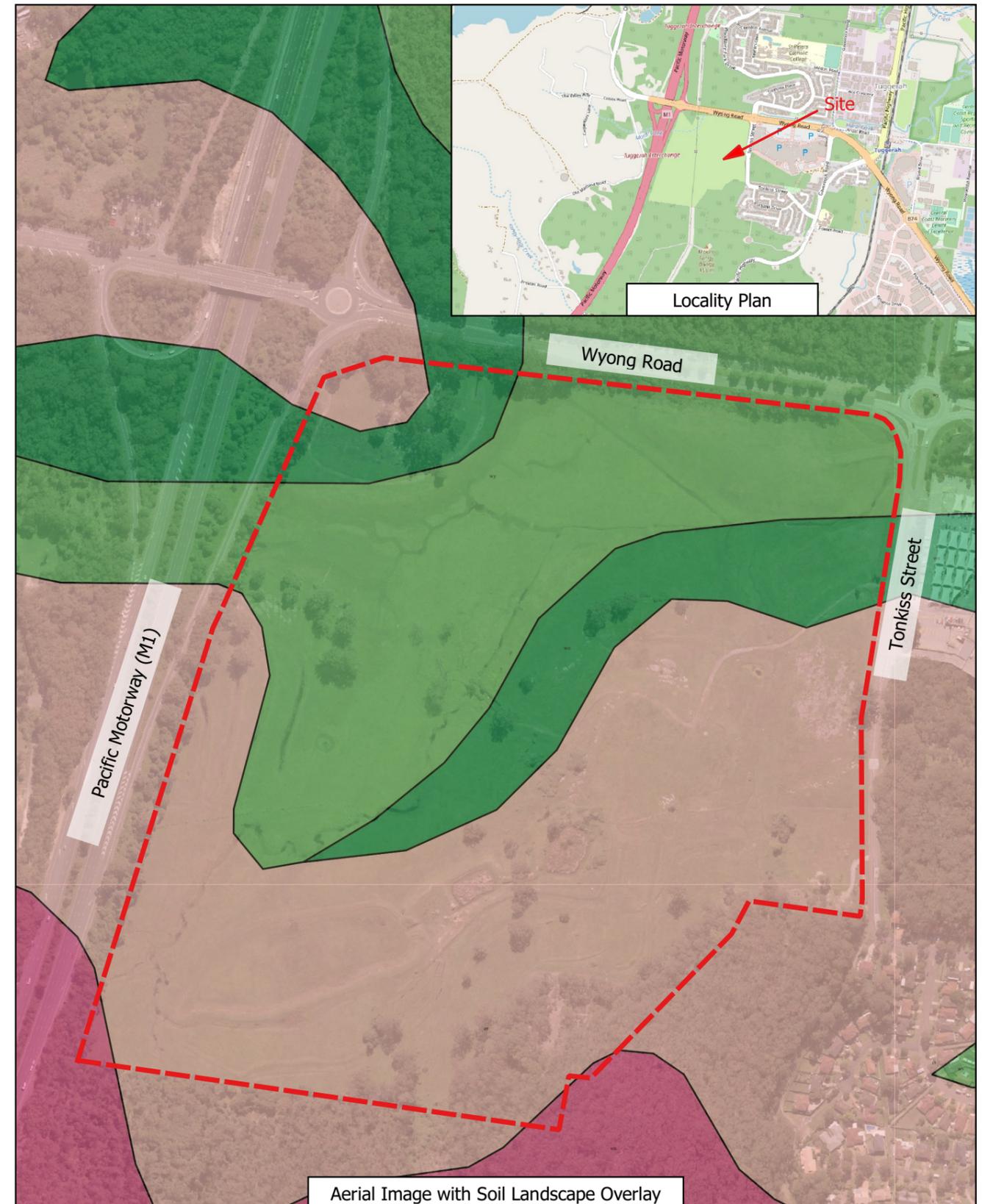
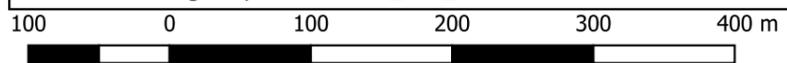
Legend	
	Approximate Imported Stockpile (Encumbered - High)
	Approximate Former Abattoir Operational Area (Encumbered - High)
	Approximate Footprint of Possible Burial Area (Encumbered - High)
	Approximate Footprint of Former Abattoir Effluent Treatment Ponds (Encumbered - Medium)
	Approximate Former Building Footprint (Encumbered - Medium)
	Approximate Site Boundary





Proposed Development with Soil Landscape Overlay

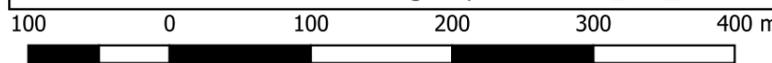
Drawing adapted from RPT\_TGP\_Structure Plan-210830 and Gosford-Lake Macquarie 1:100,000 Soil Landscapes Sheet



Aerial Image with Soil Landscape Overlay

Drawing adapted from Metromap Image and Gosford-Lake Macquarie 1:100,000 Soil Landscapes Sheet





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## **Appendix B**

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About This Report

## Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

## Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

## Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

## Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

## Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

## About this Report

### Site Anomalies

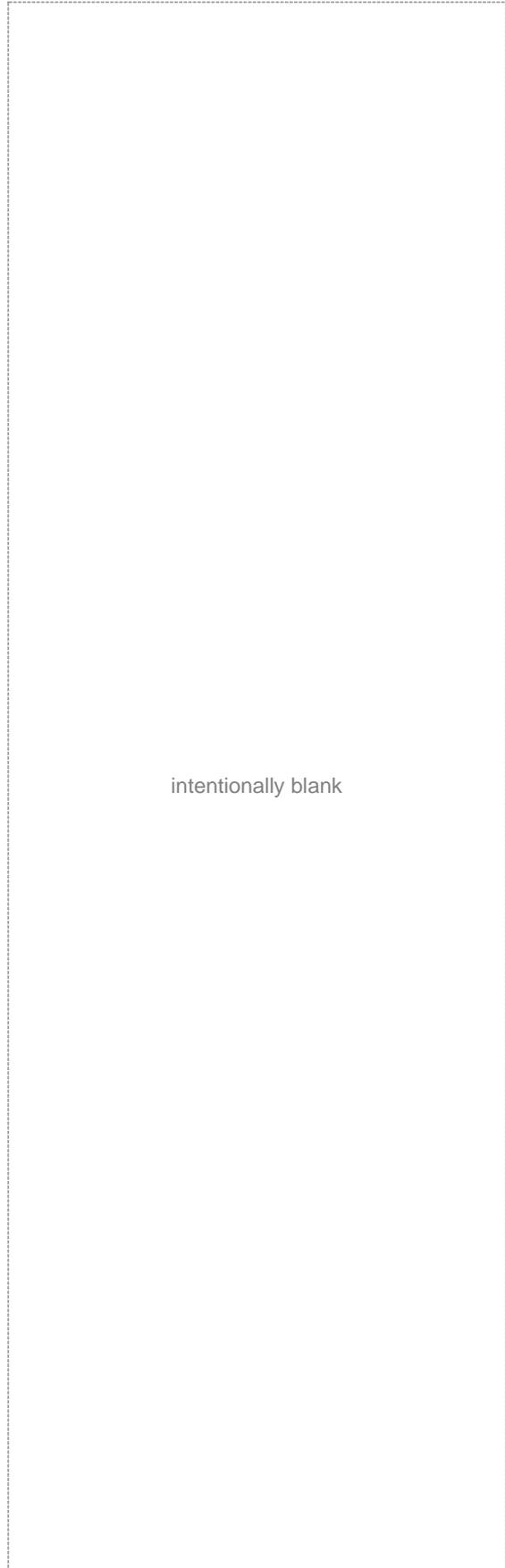
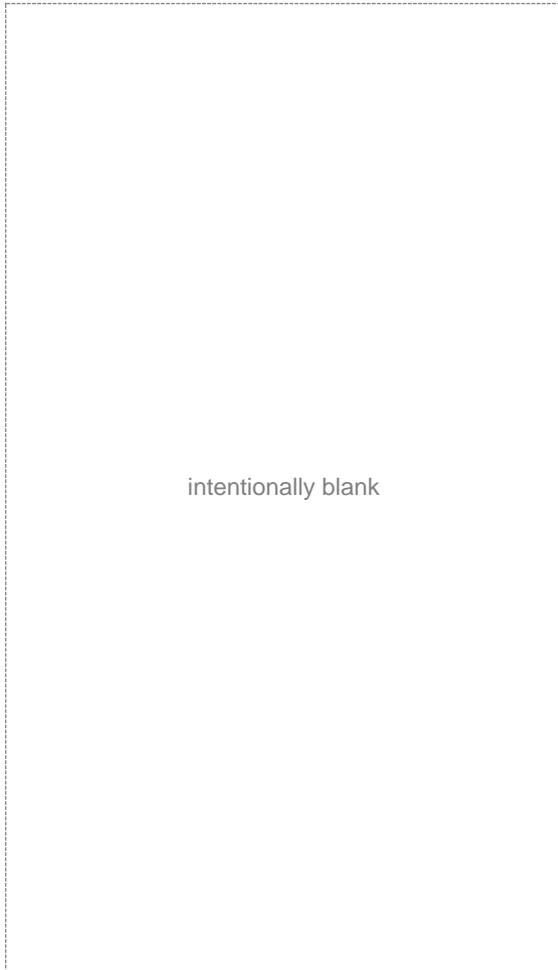
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

### Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

### Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



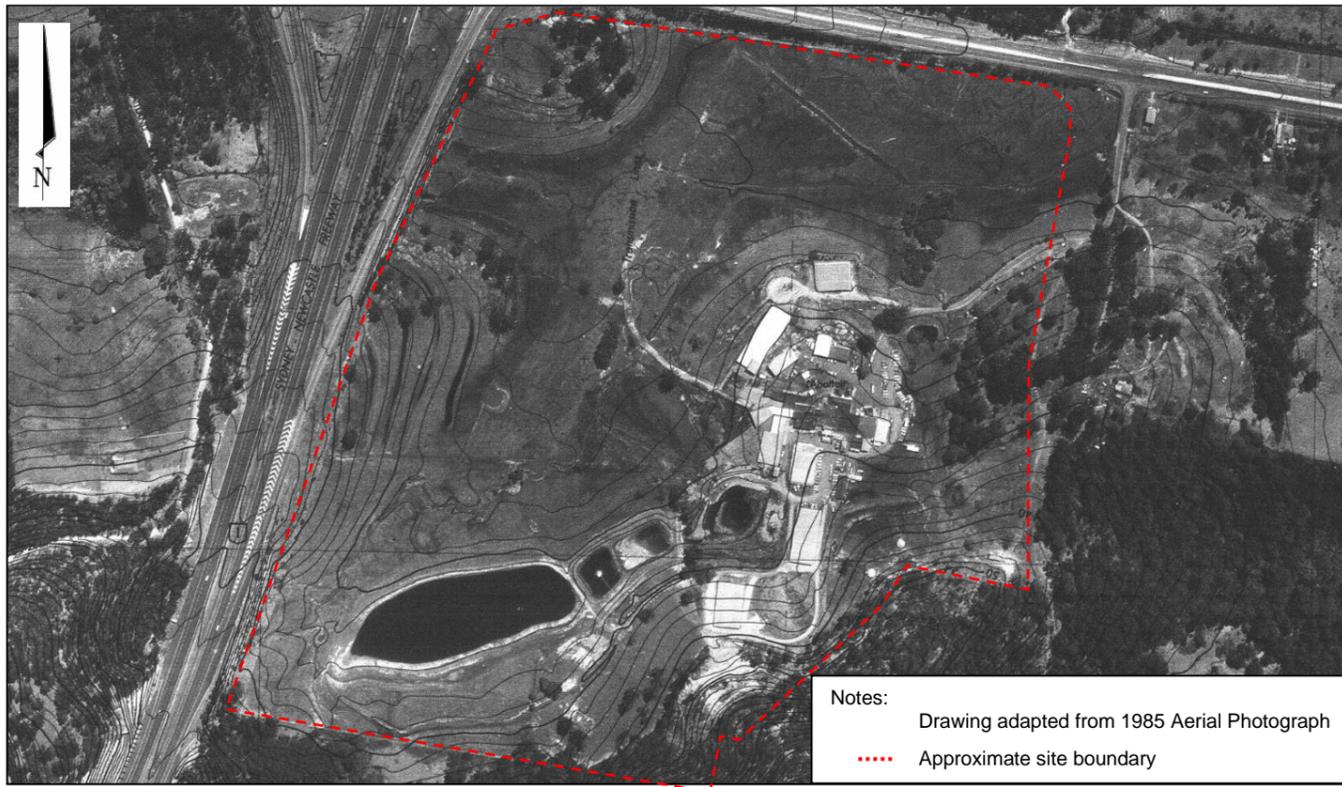
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## **Appendix C**

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Background Information







CLIENT:	Scentre Group Ltd	
OFFICE:	Central Coast	DRAWN BY: BJK
SCALE:	NTS	DATE: June 2021

TITLE: **Historical Aerial Photographs**  
**Detailed Site Investigation (Contamination)**  
**Tuggerah Gateway Site**

PROJECT No:	202794.01
DRAWING No:	C3
REVISION:	0

New Search

DA's on Exhibition

DAs Submitted

This week

Last week

This Month

Last Month

DAs Determined

CCs Submitted

CCs Determined

CDCs Submitted

CDCs Determined

SCs Submitted

SCs Determined

TAs Submitted

TAs Determined

LAs Submitted

LAs Determined

DA - 1315 / 2015 - Development Application

- Details** Description: 3 lot subdivision  
Submitted: 19/11/2015
- Decision** Decision: Refused on 19 May, 2016  
Authority: Delegated
- Status** Refused
- Properties** 68 Tonkiss Street TUGGERAH NSW 2259  
60 Wyong Road TUGGERAH NSW 2259
- People** Applicant : Scentre Group - Headquarters
- Figures** Estimated Value?: \$150,000.00  
Number of Additional Lots to be Created?: 1  
Class of Building (1 and 10=0 / 2 to 9=1): 1  
Is advertising required? (Yes=0 / No=1): 0  
Environmental Assurance Fee apply? (No=0/Yes=1): 0

<input type="checkbox"/> <b>Events</b>	<b>Started</b>	<b>Description</b>	<b>Due</b>	<b>Completed</b>
	19/11/2015	DA - Enter	19/11/2015	19/11/2015
	19/11/2015	DA - Enter Application Details	22/11/2015	24/11/2015
	24/11/2015	DA - Allocate Application	26/11/2015	27/11/2015
	27/11/2015	DA - Prepare Application for Notification	30/11/2015	27/11/2015
	02/12/2015	DA - Notification to Adjoining Owners	16/12/2015	17/12/2015
	27/11/2015	DA - Pre-Assessment of Application	14/12/2015	11/12/2015
	27/11/2015	Refer to Roads & Maritime Services	25/12/2015	03/03/2016
	27/11/2015	Refer to Contributions Officer	11/12/2015	30/11/2015
	27/11/2015	Refer to Engineer	11/12/2015	09/12/2015
	11/12/2015	DA - Awaiting Requested Information	26/02/2016	26/02/2016
	16/12/2015	Refer to Office of Environment & Heritage	13/01/2016	10/02/2016
	08/03/2016	DA - Information Request Follow up	29/03/2016	20/04/2016
	20/04/2016	DA - Information Request Follow up	04/05/2016	18/05/2016
	18/05/2016	DA - Assessment of Application	01/06/2016	18/05/2016
	18/05/2016	DA - Decision on Application	04/06/2016	19/05/2016
	19/05/2016	DA - Finalise Application	26/05/2016	25/05/2016

- Officer** Cannot connect to the database.
- Documents** **DA/1315/2015 (18/11/2015) DA/1315/2015 - 60 Wyong Rd TUGGERAH - 68 Tonk...**  
+ WMA/1723/2015 (19/11/2015) WMA/1723/2015 - 60 Wyong Rd TUGGERAH - 68 Ton...  
    ♦ D12161660 (26/11/2015) DA Assessment Report - DCP 2013 - 60 Wyong Ro... --> [Link]  
    ♦ D12344298 (25/05/2016) Refusal - 60 Wyong Road & 68 Tonkiss Street, ... --> [Link]
- Email** Contact us about this application. Please note that if you choose to make a submission on this development application via email, your email, with the exception of your address, email and telephone contact information, and signature, will be placed on Council's website in accordance with the Government Information (Public Access) Act 2009. Your submission may also be reproduced in full in Council reports or in Court proceedings.

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New Search

DA's on Exhibition

DA's Submitted

This week

Last week

This Month

Last Month

DA's Determined

CCs Submitted

CCs Determined

CDCs Submitted

CDCs Determined

SCs Submitted

SCs Determined

TAs Submitted

TAs Determined

LAs Submitted

LAs Determined

DA - 1179 / 2014 - Development Application

**Details** Description: Staged development under Section 83B of the Environmental Planning & Assessment Act, 1979 - Hardware and building supplies development including associated site works (Masters Homemaker Improvement Centre)  
Submitted: 19/12/2014

**Decision** Decision: Approved on 19 Nov, 2015  
Authority: Joint Regional Planning Panel

**Status** Approved

**Properties** 60 Wyong Road TUGGERAH NSW 2259

**People** Applicant : Scentre Ltd

**Figures** Estimated Value?: \$26,192,115.00  
Class of Building (1 and 10=0 / 2 to 9=1): 1  
Is advertising required? (Yes=0 / No=1): 0  
Environmental Assurance Fee apply? (No=0/Yes=1): 0

<input type="checkbox"/> <b>Events</b>	<b>Started</b>	<b>Description</b>	<b>Due</b>	<b>Completed</b>
	19/12/2014	DA - Enter	19/12/2014	19/12/2014
	19/12/2014	DA - Enter Application Details	22/12/2014	23/12/2014
	23/12/2014	DA - Allocate Application	29/12/2014	13/01/2015
	13/01/2015	DA - Prepare Application for Notification	16/01/2015	13/01/2015
	16/01/2015	DA - Notification to Adjoining Owners	02/02/2015	12/02/2015
	13/01/2015	DA - Pre-Assessment of Application	30/01/2015	20/02/2015
	13/01/2015	Refer to Contributions Officer	27/01/2015	08/10/2015
	13/01/2015	Refer to Engineer Traffic / Transport	27/01/2015	10/03/2015
	13/01/2015	Refer to Engineer	27/01/2015	04/02/2015
	13/01/2015	Refer to Environmental Health Officer	27/01/2015	20/01/2015
	13/01/2015	Refer to Ecologist	27/01/2015	04/05/2015
	13/01/2015	Internal Referral (General)	27/01/2015	08/10/2015
	14/01/2015	Refer to Police Force NSW	25/05/2015	25/11/2015
	22/01/2015	Refer to Office of Environment & Heritage	10/03/2015	11/03/2015
	29/01/2015	Refer to Roads & Maritime Services	18/03/2015	19/03/2015
	13/02/2015	Refer to Tree Officer	27/02/2015	17/02/2015
	20/02/2015	DA - Awaiting Requested Information	26/06/2015	24/07/2015
	06/07/2015	Refer to Engineer	20/07/2015	13/07/2015
	24/07/2015	DA - Information Request Follow up	30/09/2015	30/09/2015
	28/09/2015	Refer to Council Meeting	26/10/2015	12/11/2015
	30/09/2015	DA - Review Prior to Assessment	05/10/2015	05/10/2015
	05/10/2015	DA - Assessment of Application	19/10/2015	08/10/2015
	08/10/2015	DA - Decision on Application	12/11/2015	25/11/2015

**Officer** Cannot connect to the database.

**Documents** DA/1179/2014 (18/12/2014) DA/1179/2014 - 60 Wyong Road, TUGGERAH NSW ...  
+ WMA/1033/2014 (18/12/2014) WMA/1033/2014 - 60 Wyong Road, TUGGERAH NSW ...  
+ SCC/2/2016 (14/01/2016) SCC/2/2016 - 60 Wyong Road, TUGGERAH NSW 22...  
+ SCC/33/2016 (23/03/2016) SCC/33/2016 - 60 Wyong Road, TUGGERAH NSW 2...  
    ♦ D11807895 (18/12/2014) Development Application - 60 Wyong Rd Tuggera... --> [Link]  
    ♦ D12136314 (03/11/2015) DA\_1179\_2014 Masters final report for attachm... --> [Link]  
    ♦ D12159715 (25/11/2015) Development Consent - email - 60 Wyong Road, ... --> [Link]

**Email** Contact us about this application. Please note that if you choose to make a submission on this development application via email, your email, with the exception of your address, email and telephone contact information, and signature, will be placed on Council's website in accordance with the Government Information (Public Access) Act 2009. Your submission may also be reproduced in full in Council reports or in Court proceedings.

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# WaterNSW Work Summary

**GW054807**

Licence: 20BL117919

Licence Status: CONVERTED

Authorised Purpose(s): DOMESTIC  
Intended Purpose(s): GENERAL USE

Work Type: Bore  
Work Status: Collapsed Bore  
Construct.Method: Auger  
Owner Type: Private

Commenced Date:  
Completion Date: 01/09/1981

Final Depth: 11.50 m  
Drilled Depth: 11.50 m

Contractor Name: (None)  
Driller:  
Assistant Driller:

Property: N/A NSW  
GWMA: -  
GW Zone: -

Standing Water Level (m):  
Salinity Description:  
Yield (L/s):

## Site Details

Site Chosen By:

<b>County</b>	<b>Parish</b>	<b>Cadastre</b>
Form A: NORTHUMBERLAND	TUGGE	33
Licensed: NORTHUMBERLAND	TUGGERAH	Whole Lot //

Region: 20 - Hunter  
River Basin: 211 - MACQUARIE - TUGGERAH LAKES  
Area/District:

CMA Map: 9131-2N  
Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)  
Elevation Source: (Unknown)

Northing: 6313578.000  
Easting: 352032.000

Latitude: 33°18'24.3"S  
Longitude: 151°24'38.1"E

GS Map: -

MGA Zone: 56

Coordinate Source: GD.,ACC.MAP

## Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	6.50	102			Seated

## Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	Sand	Sand	
3.00	11.50	8.50	Clay Red	Clay	

\*\*\* End of GW054807 \*\*\*

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

# WaterNSW Work Summary

**GW066326**

Licence: 20WA215511

Licence Status: CURRENT

Authorised Purpose(s): STOCK, DOMESTIC  
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method:

Owner Type:

Commenced Date:

Completion Date: 01/05/1990

Final Depth: 39.50 m

Drilled Depth: 39.50 m

Contractor Name: (None)

Driller:

Assistant Driller:

Property: N/A NSW

GWMA: -

GW Zone: -

Standing Water Level (m): 14.000

Salinity Description:

Yield (L/s): 0.300

## Site Details

Site Chosen By:

County  
Form A: NORTHUMBERLAND

Parish  
OURIM

Cadastre  
UNKNOWN FROM  
HYDSYS  
Whole Lot 13//785788

Licensed: NORTHUMBERLAND

OURIMBAH

Region: 20 - Hunter

River Basin: 211 - MACQUARIE - TUGGERAH LAKES  
Area/District:

CMA Map:

Grid Zone:

Scale:

Elevation: 46.00 m (A.H.D.)  
Elevation Source: Est. Contour 8-15M.

Northing: 6313837.000  
Easting: 350838.000

Latitude: 33°18'15.3"S  
Longitude: 151°23'52.1"E

GS Map: -

MGA Zone: 56

Coordinate Source: GD., ACC.MAP

## Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	P.V.C.	-0.30	2.40	168			
1	1	Casing	Poured Concrete	0.00	2.40				

## Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
13.80	14.10	0.30	Consolidated	14.00		0.06			
39.20	39.50	0.30	Consolidated	14.00		0.30			

## Remarks

19/11/2009: Updated details as per existing data.

\*\*\* End of GW066326 \*\*\*

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

# WaterNSW Work Summary

**GW200520**

Licence: 20BL169019

Licence Status: CONVERTED

Authorised Purpose(s): IRRIGATION  
Intended Purpose(s): TEST BORE

Work Type: Bore

Work Status:

Construct.Method: Rotary - Percu

Owner Type:

Commenced Date:

Completion Date: 14/03/2003

Final Depth: 61.00 m

Drilled Depth: 61.00 m

Contractor Name: Slade Drilling

Driller: Paul Edwin Slade

Assistant Driller:

Property: N/A Cnr Wyong & Gavenlock Rd  
TUGGERAH 2259 NSW

Standing Water Level (m): 4.000

GWMA: -  
GW Zone: -

Salinity Description:  
Yield (L/s): 0.900

## Site Details

Site Chosen By:

County: NORTHUMBERLAND  
Parish: TUGGERAH  
Cadastre: 1//10625  
Form A: NORTHUMBERLAND  
Licensed: NORTHUMBERLAND  
TUGGERAH  
Whole Lot 1//10625

Region: 20 - Hunter

CMA Map:

River Basin: - Unknown  
Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)  
Elevation Source: Unknown

Northing: 6313332.000  
Easting: 352299.000

Latitude: 33°18'32.4"S  
Longitude: 151°24'48.3"E

GS Map: -

MGA Zone: 56

Coordinate Source: Map Interpre

## Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	24.00	200			Rotary - Percussion (Down Hole H
1		Hole	Hole	24.00	61.00	150			Rotary - Percussion (Down Hole H
1		Annulus	Waterworn/Rounded	3.00	24.00				Graded, Q:250.000m3
1	1	Casing	Pvc Class 9	0.00	24.00	125	109		Seated on Backfill, Glued
1	1	Opening	Slots - Diagonal	14.00	18.00	125		0	Casing - Hand Sawn Slot, PVC Class 9, SL: 100.0mm, A: 2.00mm

## Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
16.00	17.00	1.00	Unknown		4.00	0.90		03:00:00	

## Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	soil	Soil	
0.50	2.00	1.50	clay	Clay	
2.00	16.50	14.50	sandstone	Sandstone	
16.50	24.00	7.50	shale (red)	Shale	
24.00	27.00	3.00	sandstone (grey)	Sandstone	
27.00	31.00	4.00	shale (red)	Shale	
31.00	39.00	8.00	sandstone (to shale, green)	Sandstone	
39.00	43.00	4.00	shale (red)	Shale	
43.00	61.00	18.00	sandstone (grey)	Sandstone	

## Remarks

14/03/2003: Form A Remarks:

Sump installed from 18m to 24m and pressure cemented from 0m to 3m. Hole partially backfilled from 24m to 61m with sand, and then from 23m to 24m with gravel.

**\*\*\* End of GW200520 \*\*\***

**Warning To Clients:** This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.



SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252  
Customer Experience 13 10 50  
ABN 81 913 830 179 | [www.safework.nsw.gov.au](http://www.safework.nsw.gov.au)

Our Ref: D21/059986

22 April 2021

Mr Brent Kerry  
Douglas Partners  
[Brent.kerry@douglaspartners.com.au](mailto:Brent.kerry@douglaspartners.com.au)

Dear Mr Kerry

**RE SITE: 60 Wyong Rd, Tuggerah NSW 2259**

I refer to your site search request received by SafeWork NSW requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email [licensing@safework.nsw.gov.au](mailto:licensing@safework.nsw.gov.au)

Yours sincerely

A handwritten signature in black ink, appearing to read 'G Draper', written in a cursive style.

Gabriela Draper

Licensing Representative  
Licensing and Funds, Better Regulation  
SafeWork NSW

## Brent Kerry

---

**From:** Kerri Donelan <Kerri.Donelan@centralcoast.nsw.gov.au>  
**Sent:** Monday, 19 April 2021 11:42 AM  
**To:** Brent Kerry  
**Subject:** RE: Informal GIPA Request  
**Attachments:** URS report.pdf; Copyright\_authority\_form.pdf

**Categories:** Filed by Newforma

Hi Brent

I have found the report by URS see contents page attached. You can come in and view it ask for document number D00926644, it has other reports that were done for the site. In the list it is named Westfield Tuggerah ESA Report Final. I've attached the consent to council form if URS signs it then send it back to me for the release of the report.

Regards

Kerri

**Kerri Donelan**

Legal and Research Officer  
Governance Services

**Central Coast Council**

P.O. Box 20 Wyong, NSW 2259

t: 02 4350 5223

e: [Kerri.Donelan@centralcoast.nsw.gov.au](mailto:Kerri.Donelan@centralcoast.nsw.gov.au)



## COVID-19 information and updates

We are continuing to monitor daily developments in response to COVID-19. Find out the latest

[LEARN MORE](#)

 Please consider the environment before printing this email

---

**From:** Brent Kerry <Brent.Kerry@douglaspartners.com.au>  
**Sent:** Wednesday, 24 March 2021 1:44 PM  
**To:** Central Coast Council <Ask@centralcoast.nsw.gov.au>  
**Subject:** Informal GIPA Request

**[EXTERNAL EMAIL]** Do not click any links or attachments unless you have checked the sender and trust the content is safe. If you are unsure, please report this to IM+T Service Desk.

Hi,

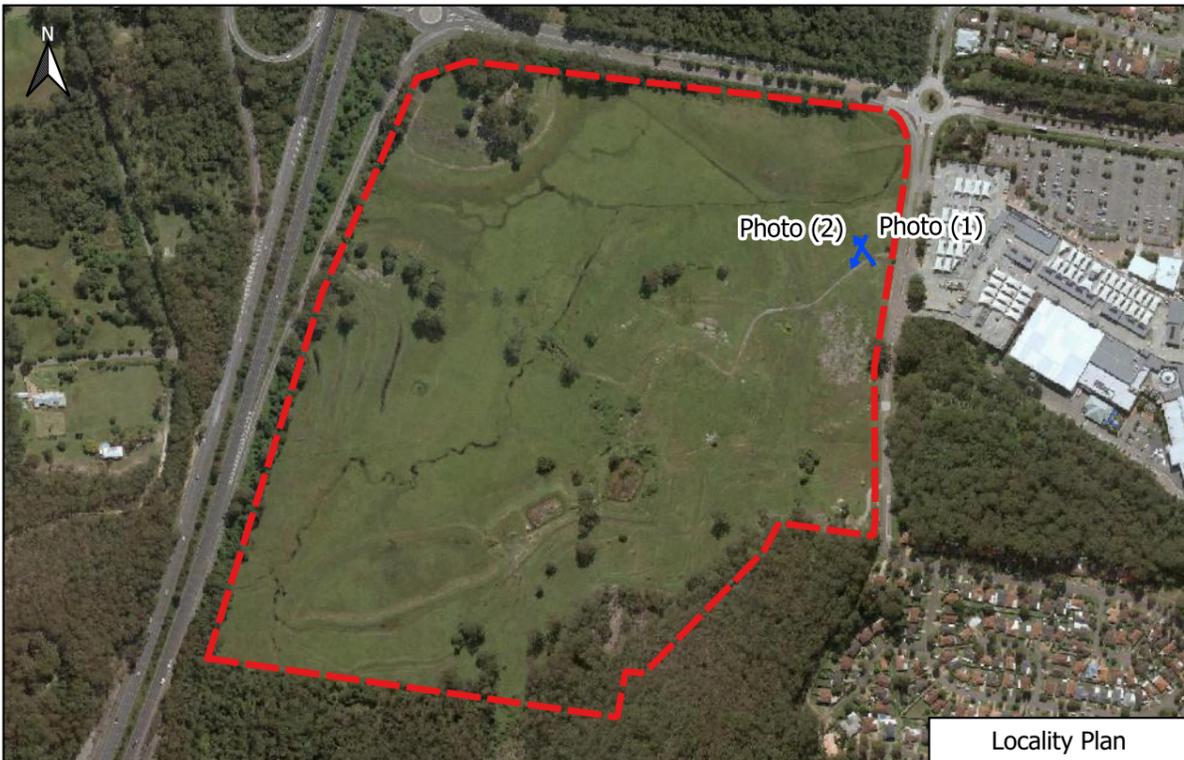
Please see attached the Informal GIPA Request Form for the Tuggerah Gateway Site (60 Wyong Road, Tuggerah). Please contact me if you have any queries regarding the request.

---

## **Appendix D**

---

Site Photographs



Legend  
 Approximate Photo Location / Direction



**Photo (1)**



**Photo (2)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

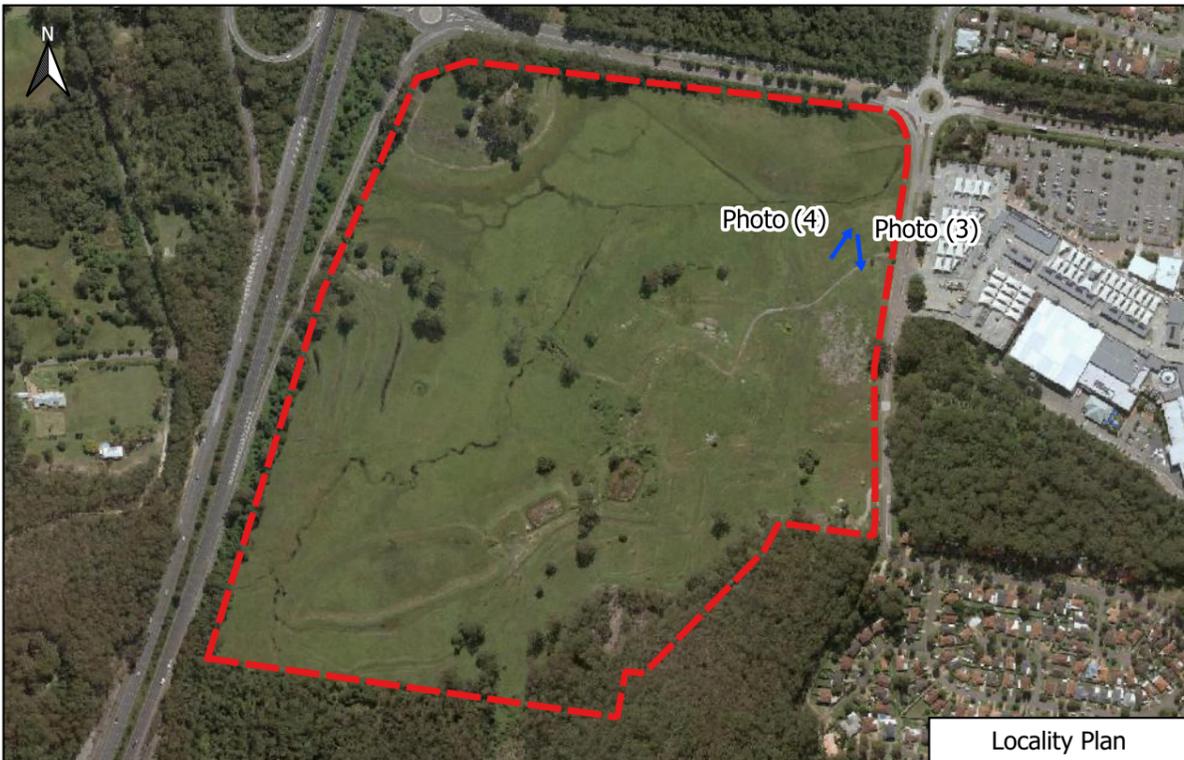


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 1

REVISION: 0



Legend  
 ← Approximate Photo Location / Direction



**Photo (3)**



**Photo (4)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

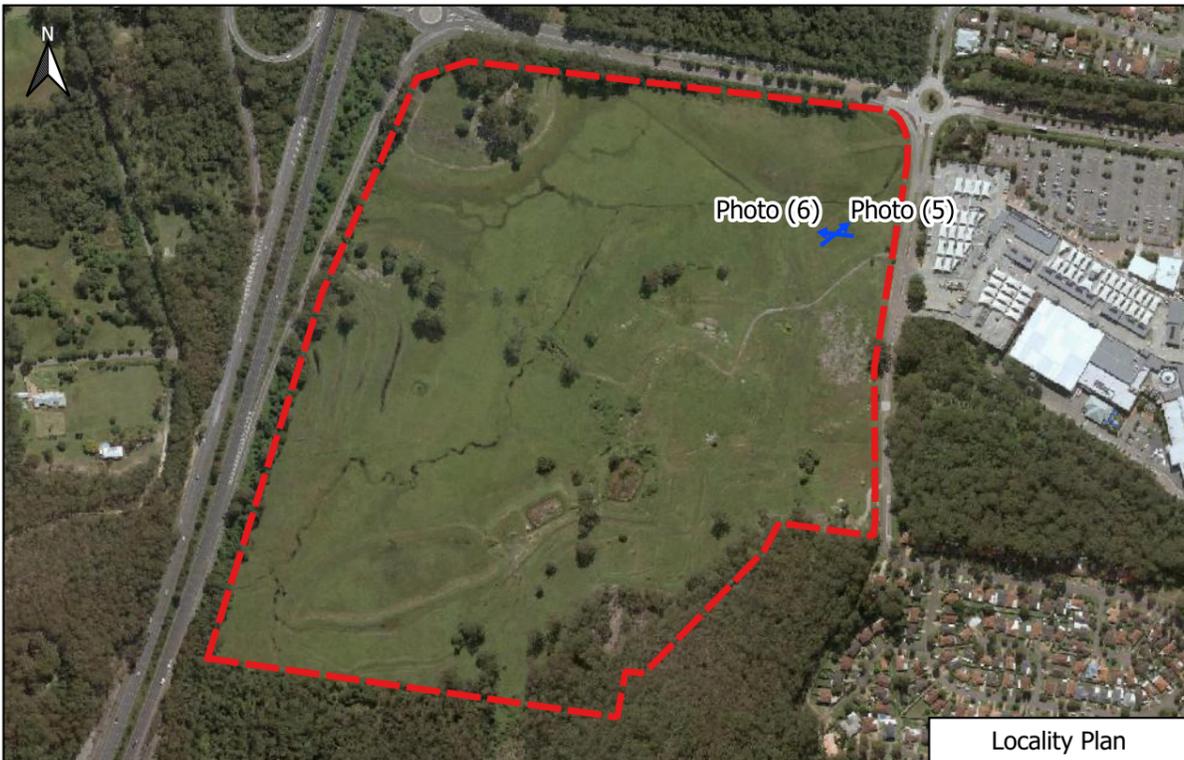


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 2

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (5)**



**Photo (6)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

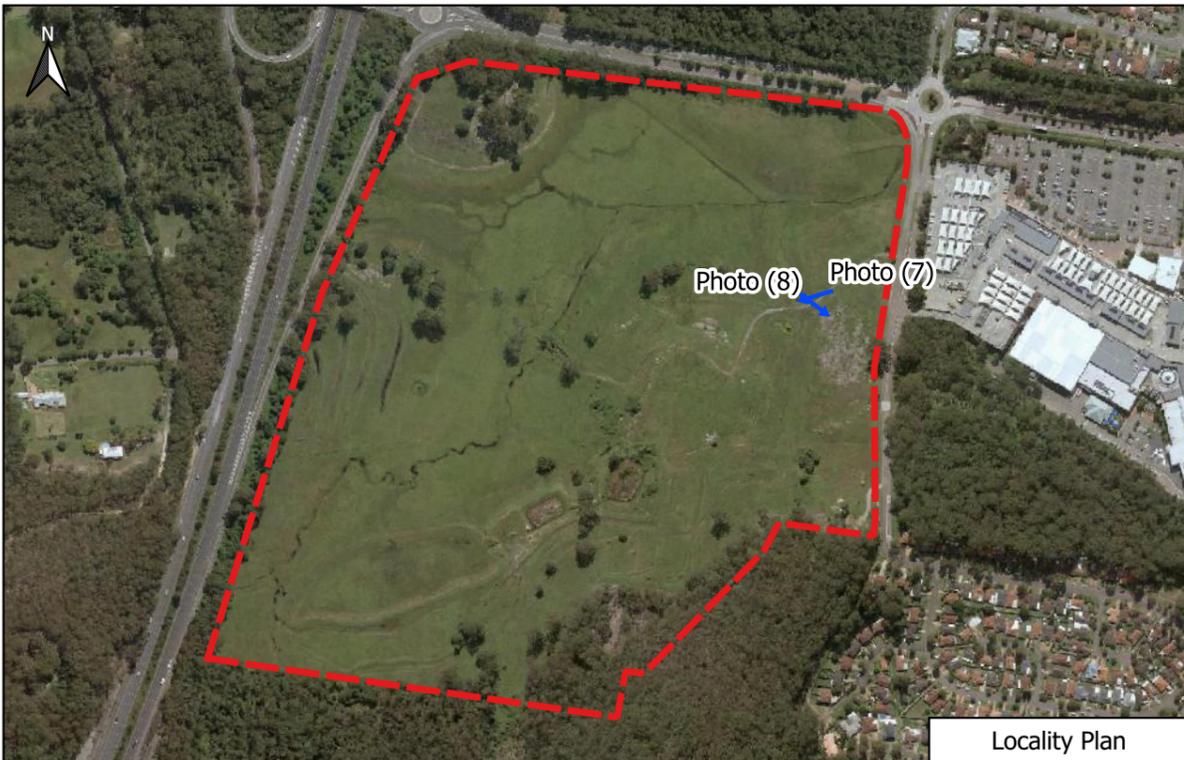


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 3

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (7)**



**Photo (8)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 4

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (9)**



**Photo (10)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

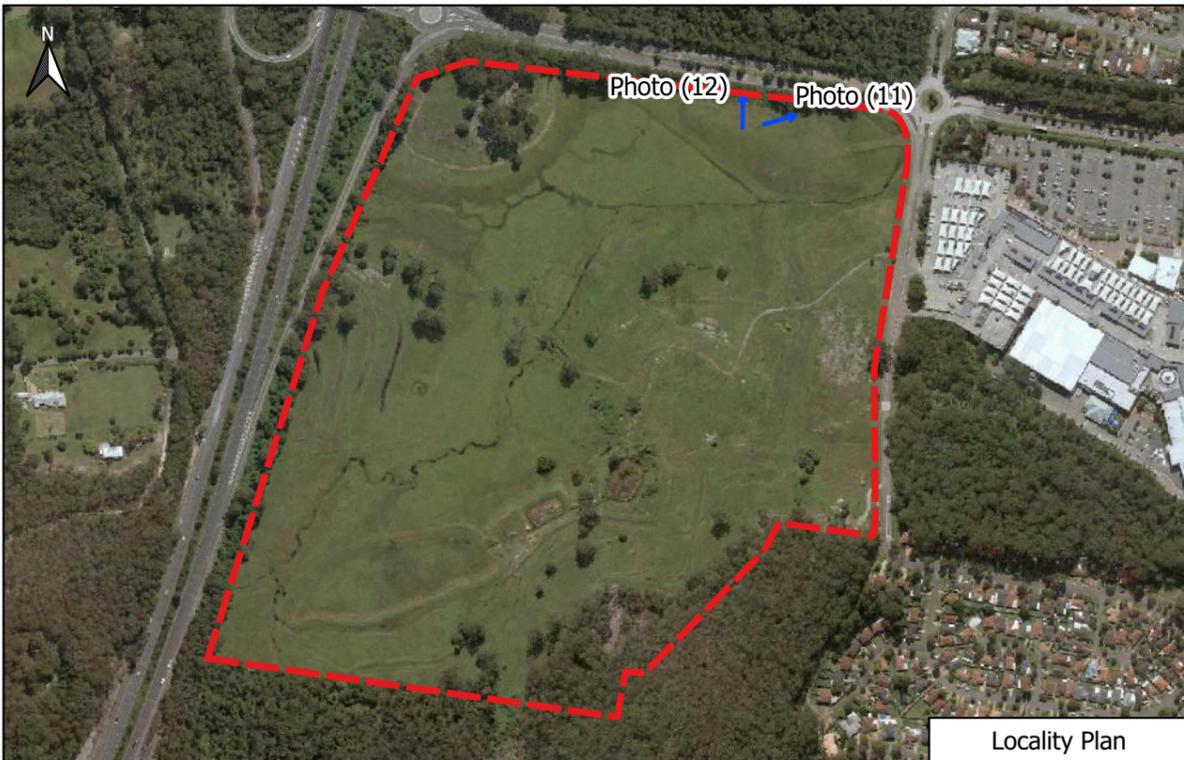


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 5

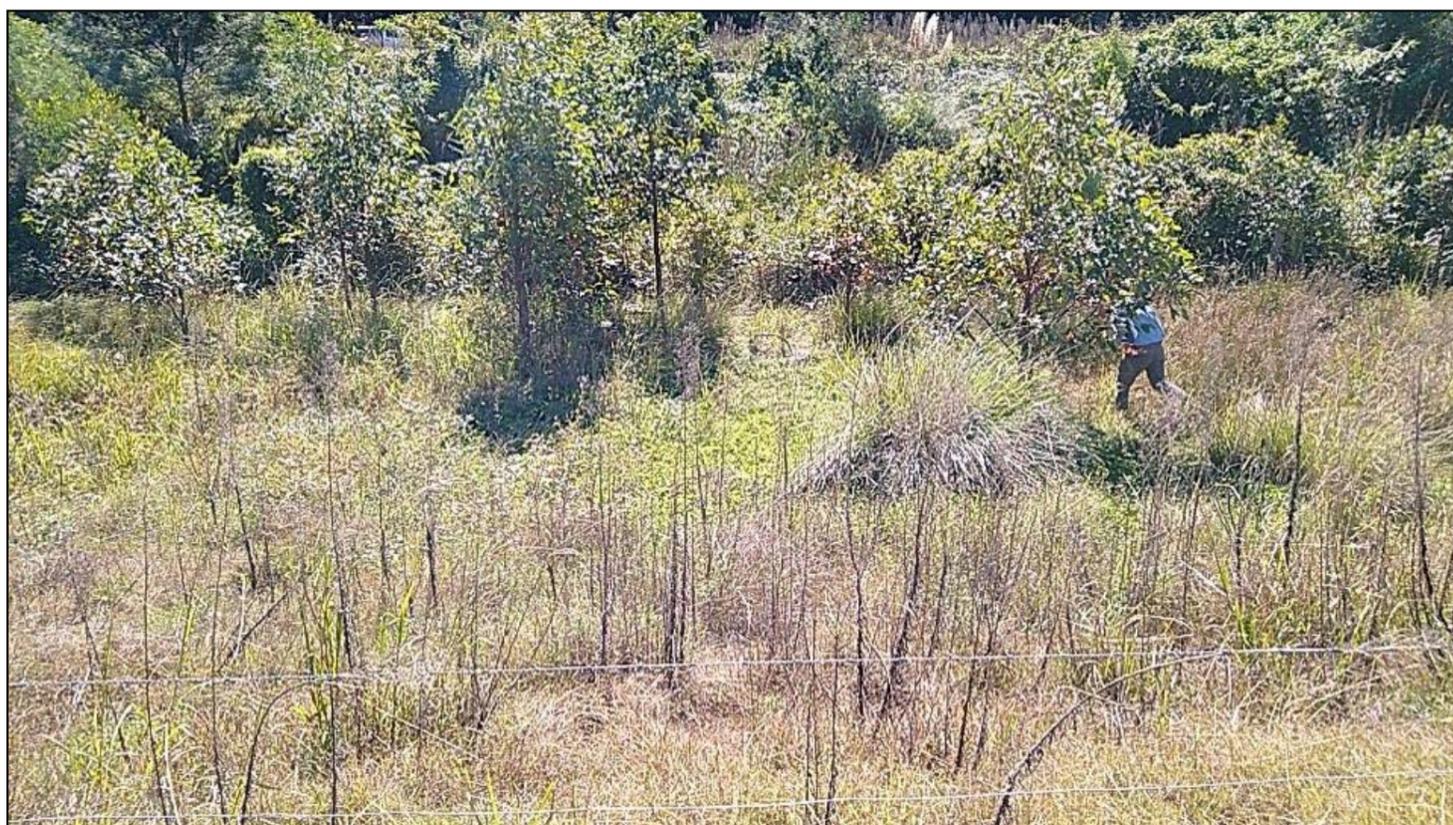
REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (11)**



**Photo (12)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

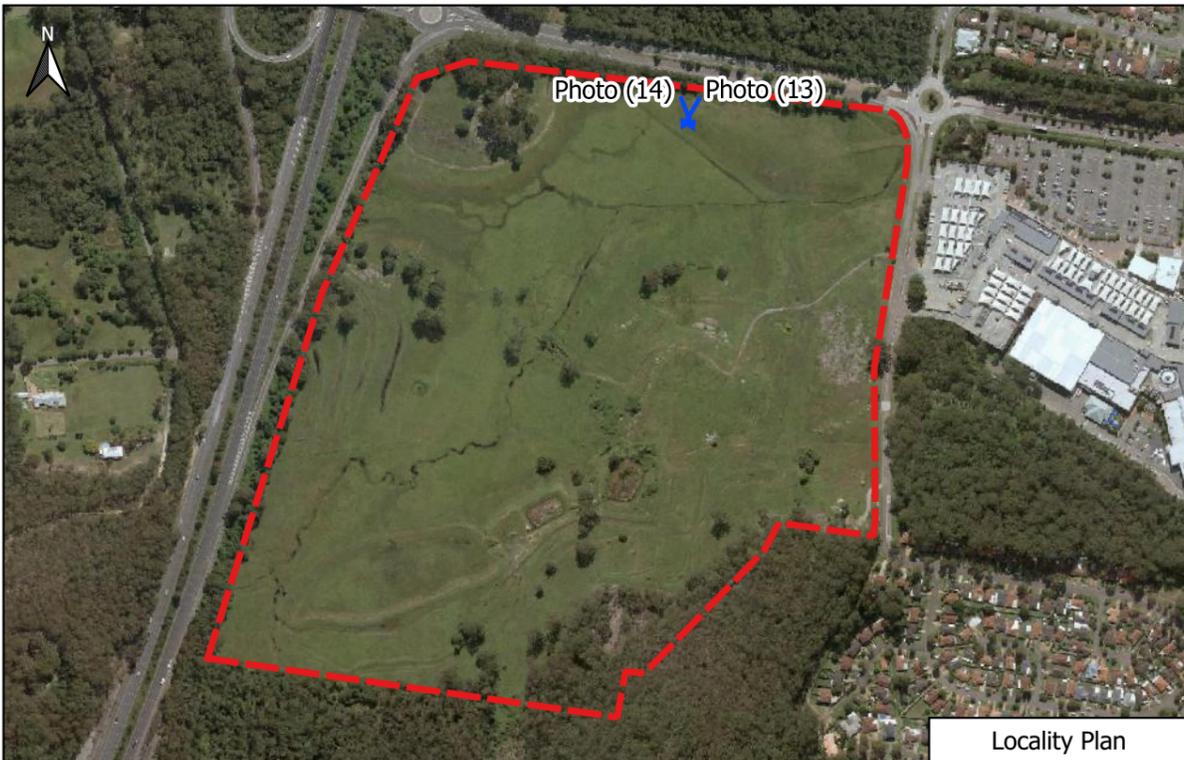


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 6

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (13)**



**Photo (14)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 7

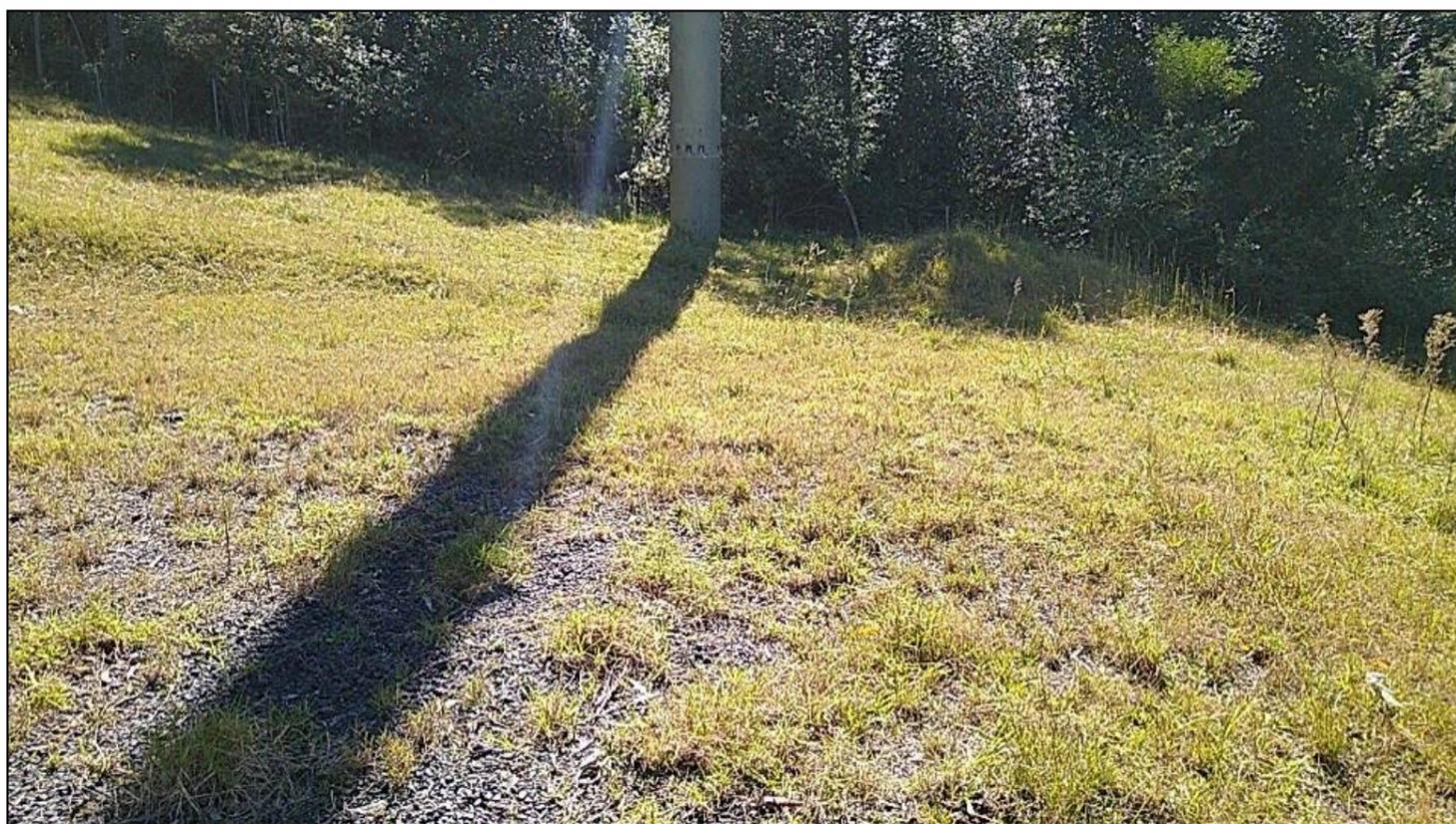
REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (15)**



**Photo (16)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 8

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (17)**



**Photo (18)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 9

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (19)**



**Photo (20)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 10

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (21)**



**Photo (22)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

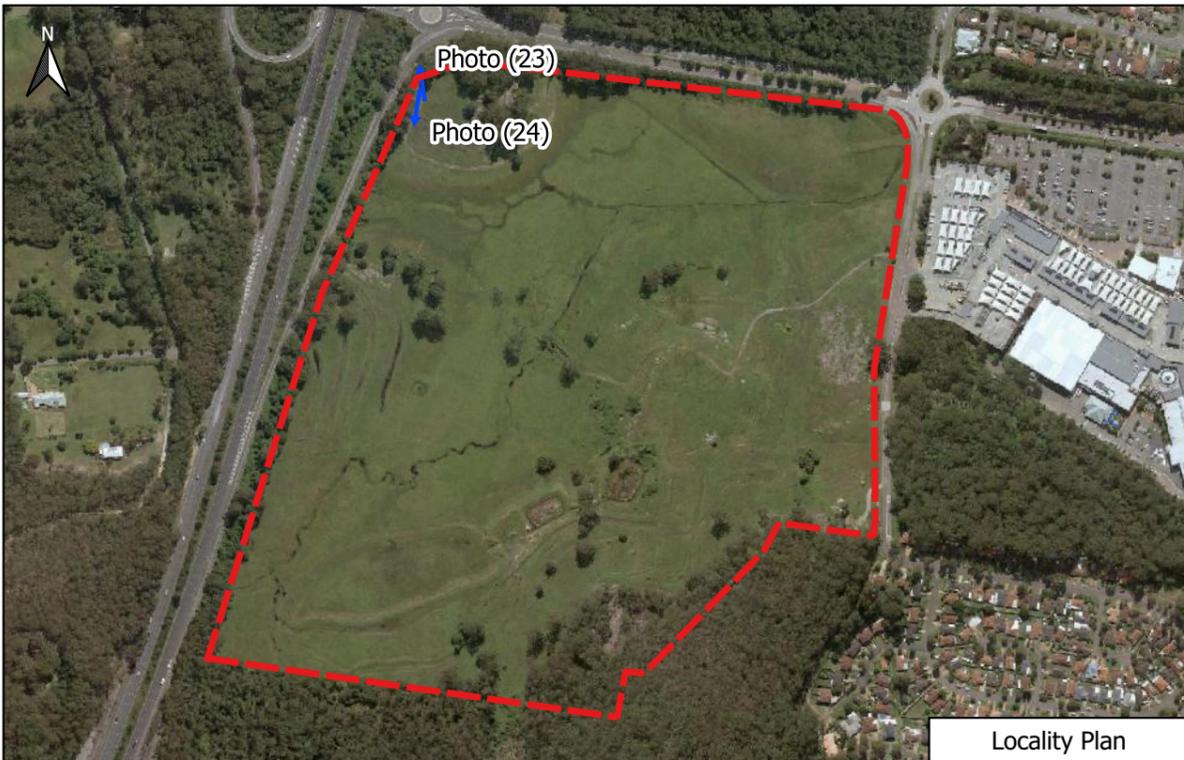


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 11

REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction

Locality Plan



Photo (23)



Photo (24)

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

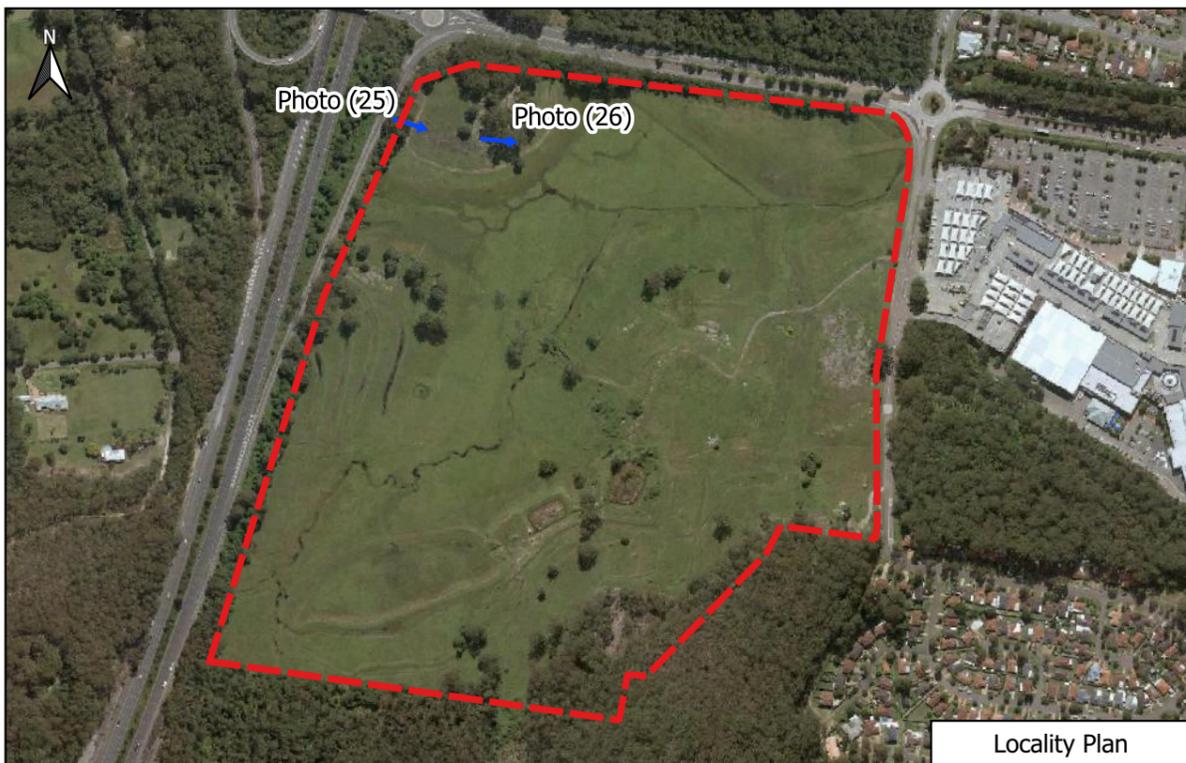


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 12

REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction

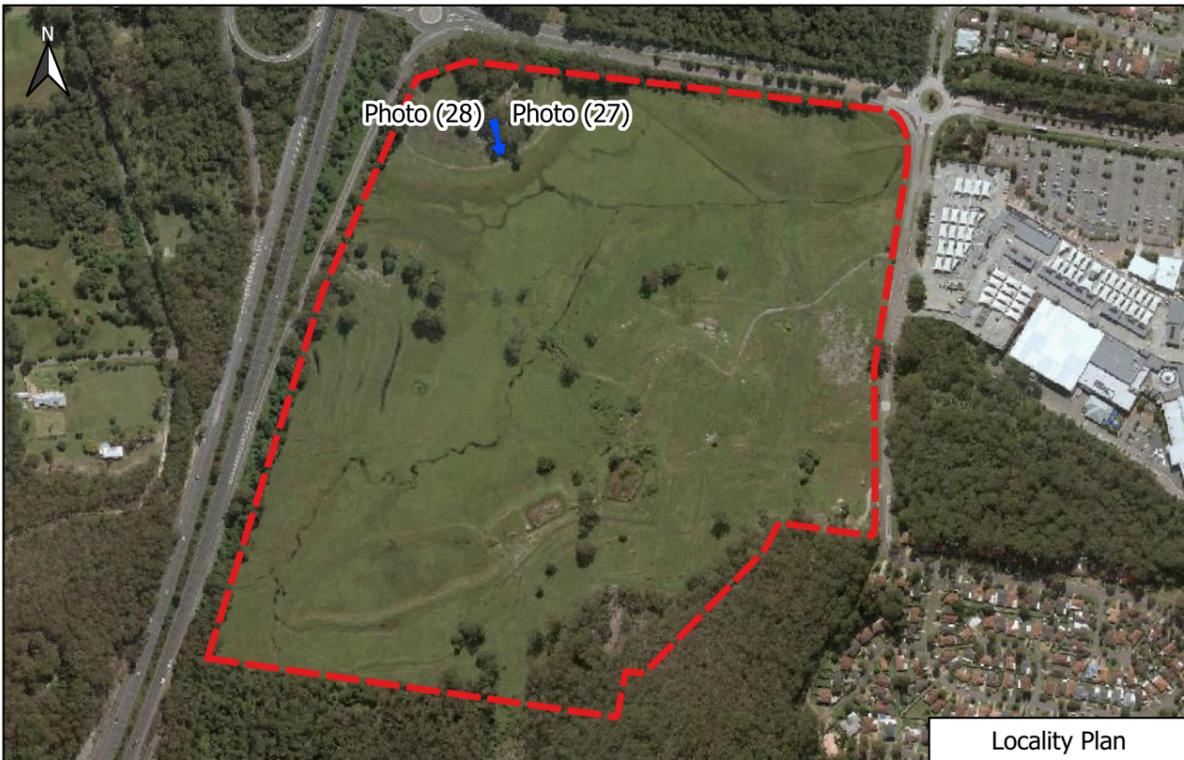


Photo (25)



Photo (26)

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A		PROJECT No: 202794.00
	TITLE: <b>Photo Plates</b> <b>Tuggerah Gateway Project</b> <b>60 Wyong Road, Tuggerah</b>				DATE: 30.07.21
					PHOTO PLATE No: 13
					REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction



Photo (27)



Photo (28)

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 14

REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction



**Photo (29)**



**Photo (30)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 15

REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction



**Photo (31)**



**Photo (32)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 16

REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction



**Photo (33)**



**Photo (34)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 17

REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction



**Photo (35)**



**Photo (36)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A		PROJECT No: 202794.00
	<b>TITLE: Photo Plates</b> <b>Tuggerah Gateway Project</b> <b>60 Wyong Road, Tuggerah</b>				DATE: 30.07.21
					PHOTO PLATE No: 18
					REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction



**Photo (37)**



**Photo (38)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 19

REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction



**Photo (39)**



**Photo (40)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

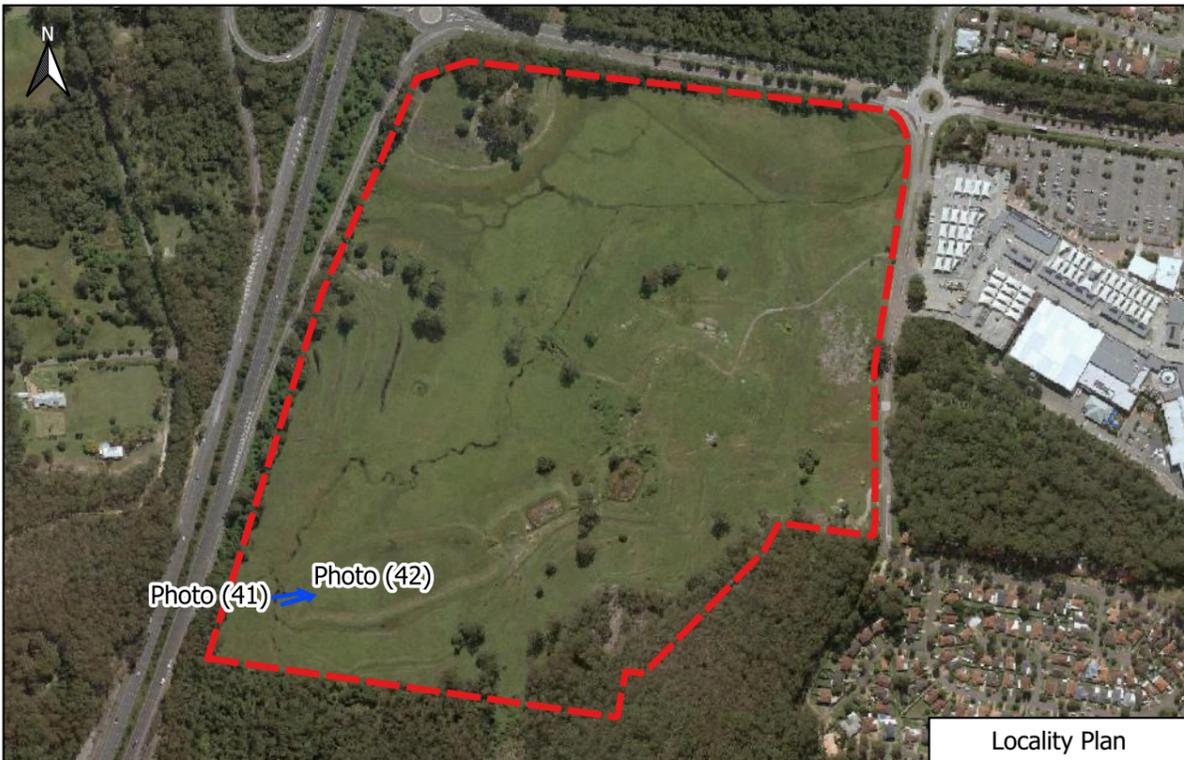


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 20

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (41)**



**Photo (42)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 21

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (43)**



**Photo (44)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 22

REVISION: 0



Legend  
 → Approximate Photo Location / Direction



**Photo (45)**



**Photo (46)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

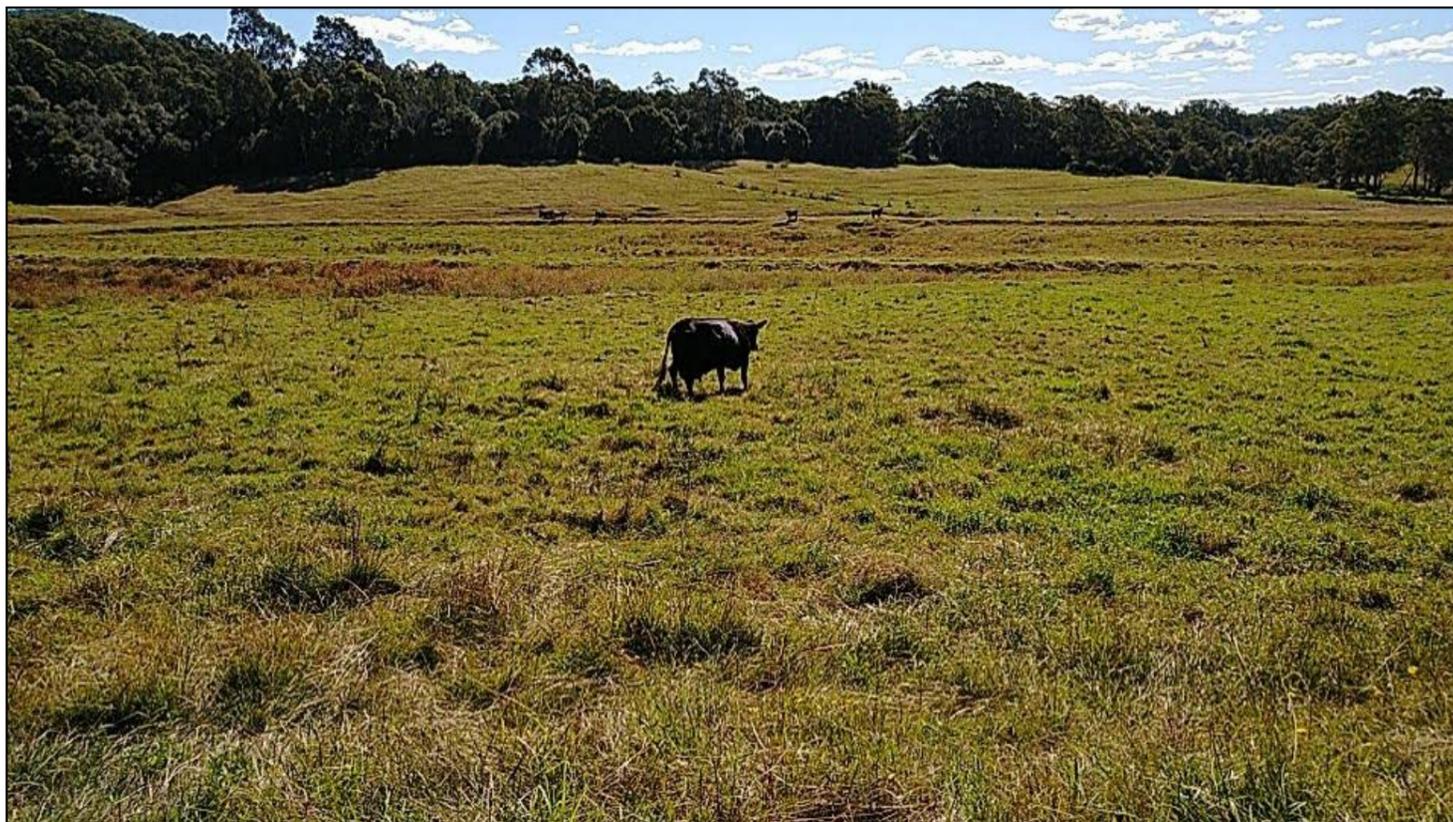
DATE: 30.07.21

PHOTO PLATE No: 23

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (47)**



**Photo (48)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 24

REVISION: 0



Legend  
 ↓ Approximate Photo Location / Direction



**Photo (49)**



**Photo (50)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A		PROJECT No: 202794.00
	TITLE: Photo Plates				DATE: 30.07.21
	Tuggerah Gateway Project				PHOTO PLATE No: 25
	60 Wyong Road, Tuggerah				REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (51)**



**Photo (52)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A		PROJECT No: 202794.00
	TITLE: <b>Photo Plates</b>				DATE: 30.07.21
	Tuggerah Gateway Project				PHOTO PLATE No: 26
	60 Wyong Road, Tuggerah				REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (53)**



**Photo (54)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A	 PROJECT No: 202794.00 DATE: 30.07.21 PHOTO PLATE No: 27 REVISION: 0
 <b>Douglas Partners</b> Geotechnics   Environment   Groundwater				
TITLE: <b>Photo Plates</b> <b>Tuggerah Gateway Project</b> <b>60 Wyong Road, Tuggerah</b>				



Legend  
 Approximate Photo Location / Direction



**Photo (55)**



**Photo (56)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

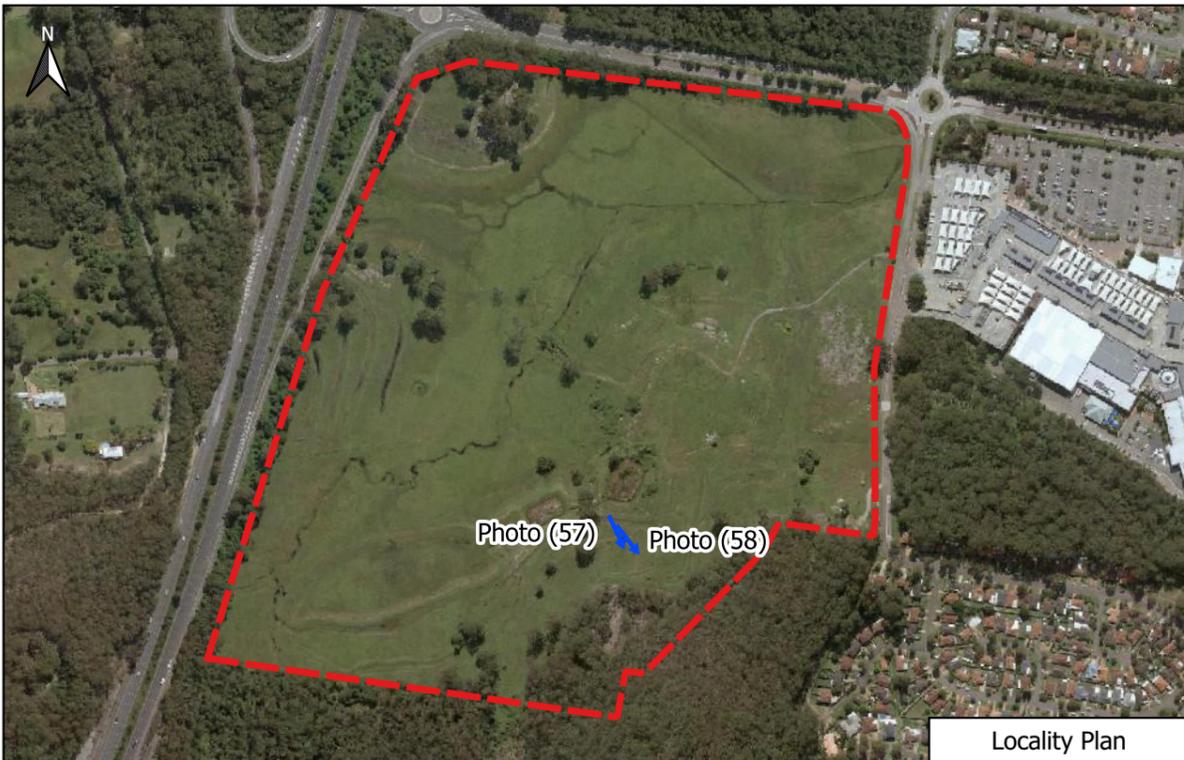


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 28

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (57)**



**Photo (58)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 29

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (59)**



**Photo (60)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 30

REVISION: 0



Legend  
 ↓ Approximate Photo Location / Direction

Locality Plan



Photo (61)



Photo (62)

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: Photo Plates  
 Tuggerah Gateway Project  
 60 Wyong Road, Tuggerah



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 31

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (63)**



**Photo (64)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

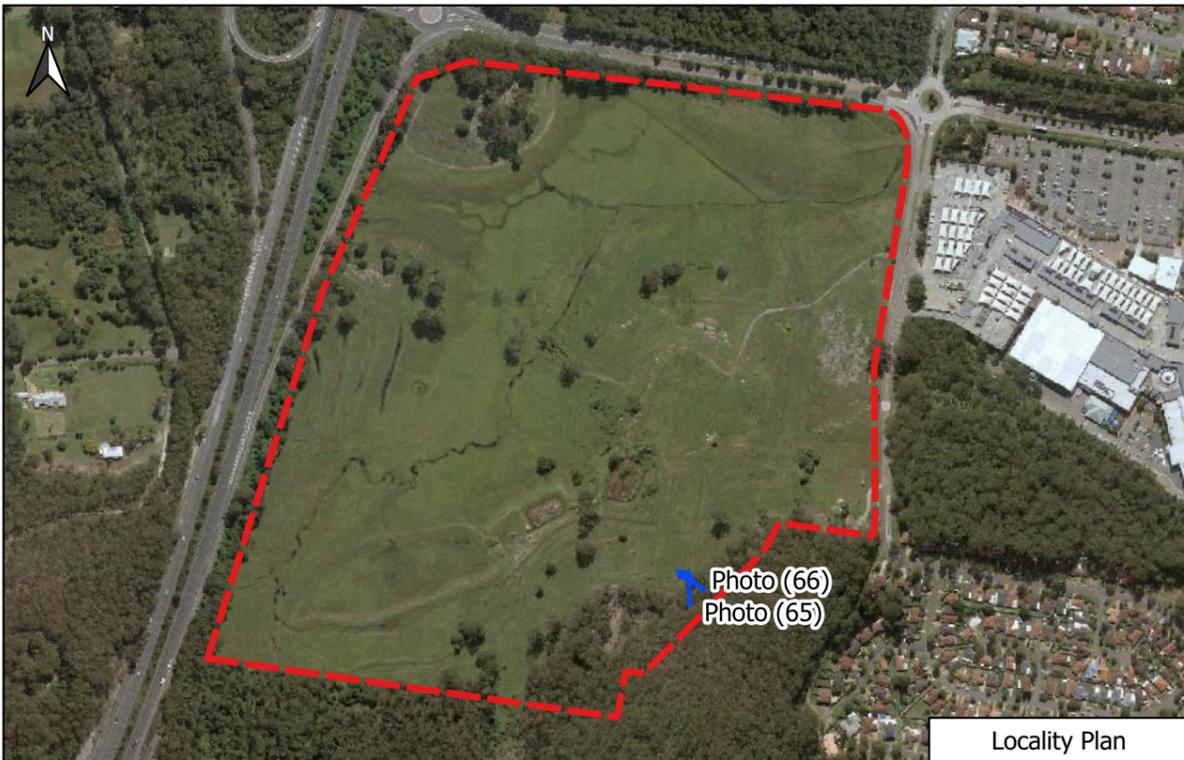


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 32

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (65)**



**Photo (66)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 33

REVISION: 0



Legend  
 Approximate Photo Location / Direction

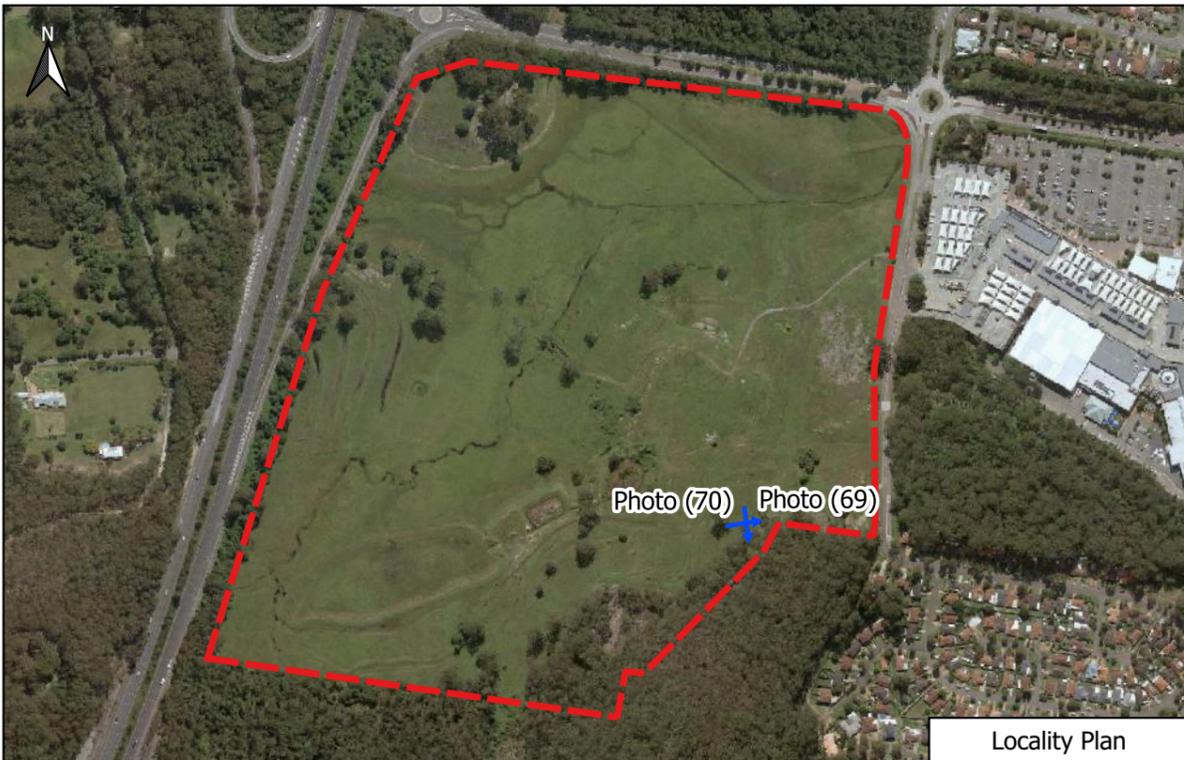


**Photo (67)**



**Photo (68)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A	 PROJECT No: 202794.00 DATE: 30.07.21 PHOTO PLATE No: 34 REVISION: 0
 <b>Douglas Partners</b> Geotechnics   Environment   Groundwater				
TITLE: <b>Photo Plates</b> <b>Tuggerah Gateway Project</b> <b>60 Wyong Road, Tuggerah</b>				



Legend  
 → Approximate Photo Location / Direction



**Photo (69)**



**Photo (70)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A		PROJECT No: 202794.00
	TITLE: Photo Plates				DATE: 30.07.21
	Tuggerah Gateway Project				PHOTO PLATE No: 35
	60 Wyong Road, Tuggerah				REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (71)**



**Photo (72)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 36

REVISION: 0



Legend  
 ↓ Approximate Photo Location / Direction



**Photo (73)**



**Photo (74)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 37

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (75)**



**Photo (76)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 38

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (77)**



**Photo (78)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A		PROJECT No: 202794.00
 <b>Douglas Partners</b> Geotechnics   Environment   Groundwater					DATE: 30.07.21
					PHOTO PLATE No: 39
					REVISION: 0
TITLE: <b>Photo Plates</b> <b>Tuggerah Gateway Project</b> <b>60 Wyong Road, Tuggerah</b>					



Legend  
 Approximate Photo Location / Direction



**Photo (79)**



**Photo (80)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 40

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (81)**



**Photo (82)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A	 PROJECT No: 202794.00 DATE: 30.07.21 PHOTO PLATE No: 41 REVISION: 0
 <b>Douglas Partners</b> Geotechnics   Environment   Groundwater				
TITLE: <b>Photo Plates</b> <b>Tuggerah Gateway Project</b> <b>60 Wyong Road, Tuggerah</b>				



Legend  
 Approximate Photo Location / Direction



**Photo (83)**



**Photo (84)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A		PROJECT No: 202794.00
 <b>Douglas Partners</b> Geotechnics   Environment   Groundwater					DATE: 30.07.21
					PHOTO PLATE No: 42
					REVISION: 0
TITLE: <b>Photo Plates</b> <b>Tuggerah Gateway Project</b> <b>60 Wyong Road, Tuggerah</b>					



Legend  
 Approximate Photo Location / Direction



**Photo (85)**



**Photo (86)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 43

REVISION: 0



Legend  
 ↓ Approximate Photo Location / Direction



**Photo (87)**



**Photo (88)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 44

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (89)**



**Photo (90)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 45

REVISION: 0



Legend  
 → Approximate Photo Location / Direction

Locality Plan



Photo (91)



Photo (92)

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 46

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (93)**



**Photo (94)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 47

REVISION: 0



Legend  
 Approximate Photo Location / Direction

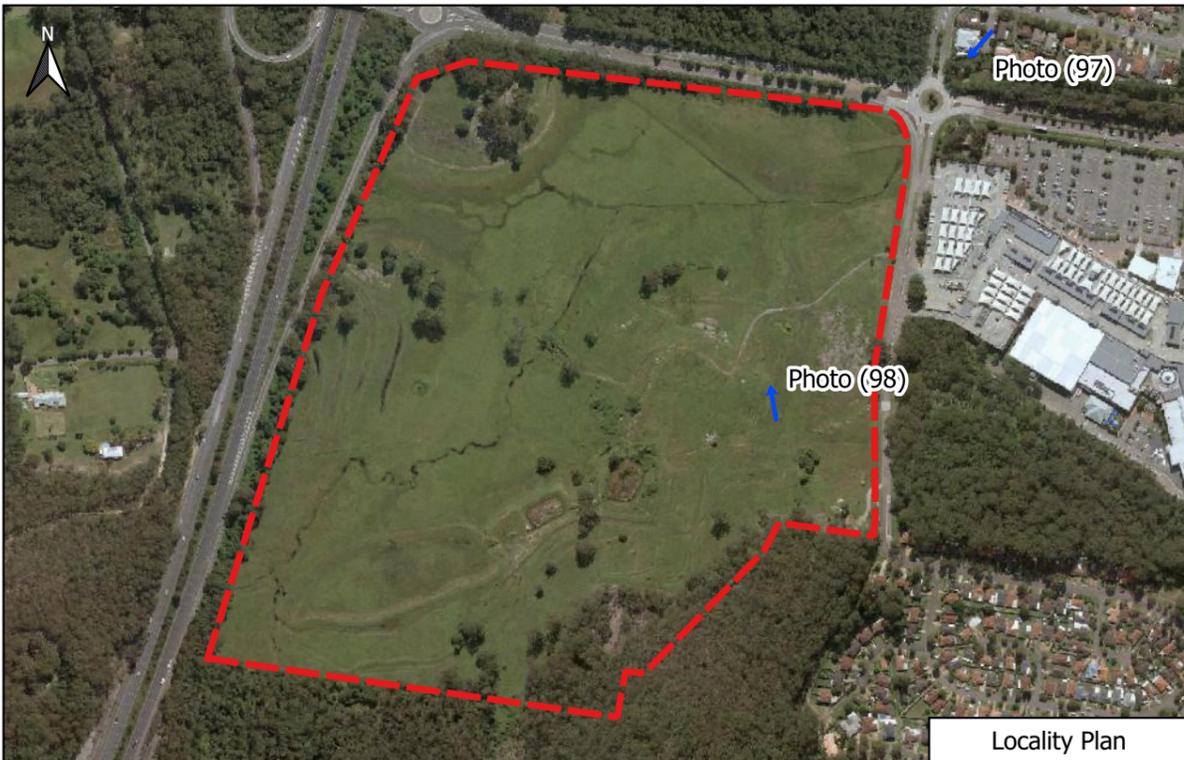


**Photo (95)**



**Photo (96)**

CLIENT: Scentre Limited	OFFICE: Central Coast	DRAWN BY: TDM	SCALE: N/A		PROJECT No: 202794.00
	TITLE: <b>Photo Plates</b>				DATE: 30.07.21
	Tuggerah Gateway Project				PHOTO PLATE No: 48
	60 Wyong Road, Tuggerah				REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (97)**



**Photo (98)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 49

REVISION: 0



Legend  
 Approximate Photo Location / Direction

Locality Plan



Photo (99)



Photo (100)

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 50

REVISION: 0



Legend  
 → Approximate Photo Location / Direction



**Photo (101)**



**Photo (102)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 51

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (103)**



**Photo (104)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 52

REVISION: 0



Legend  
 → Approximate Photo Location / Direction

Locality Plan



Photo (105)

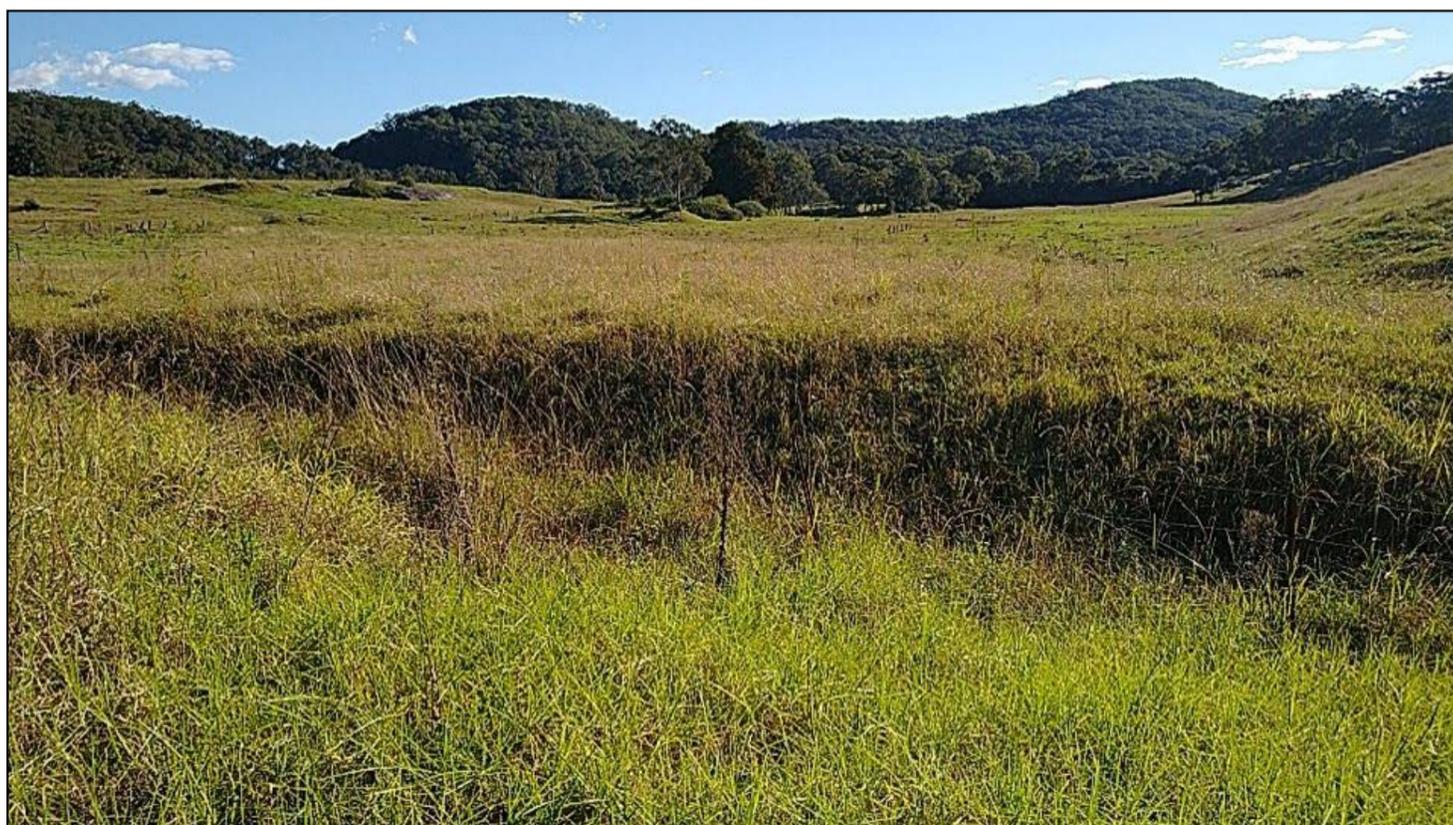


Photo (106)

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 53

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (107)**



**Photo (108)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

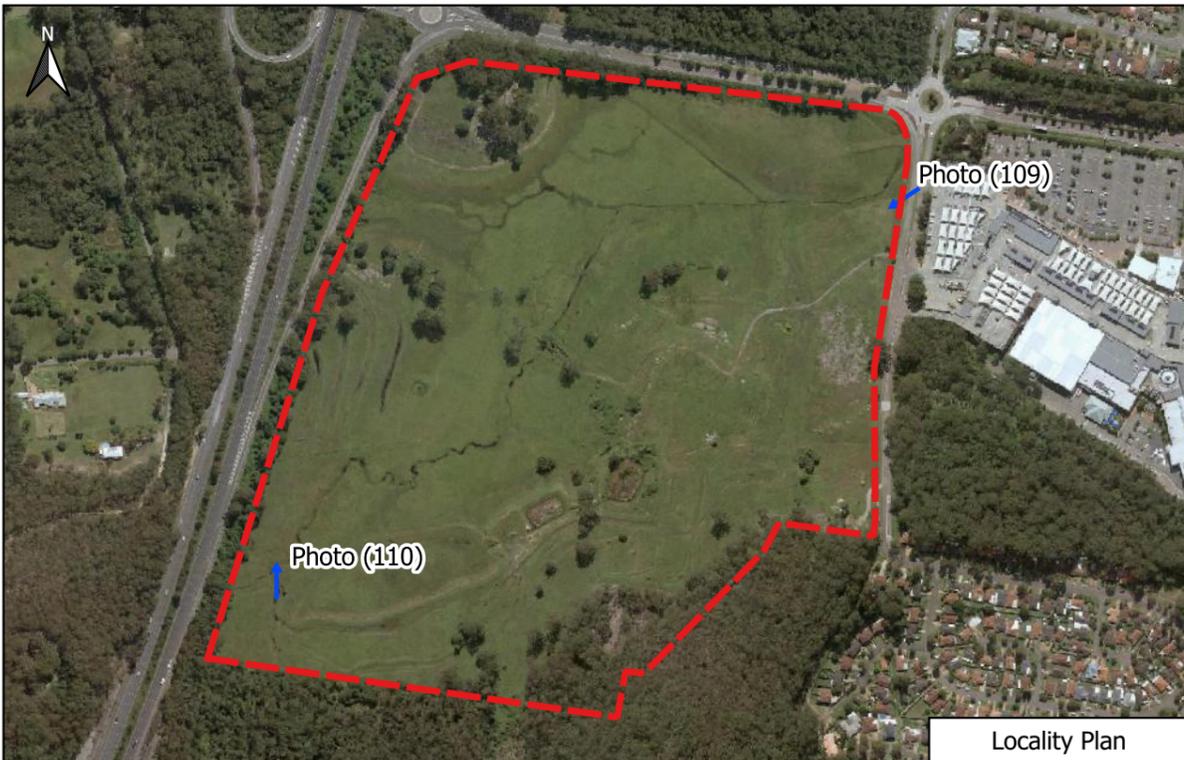


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 54

REVISION: 0



Legend  
 → Approximate Photo Location / Direction



**Photo (109)**



**Photo (110)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

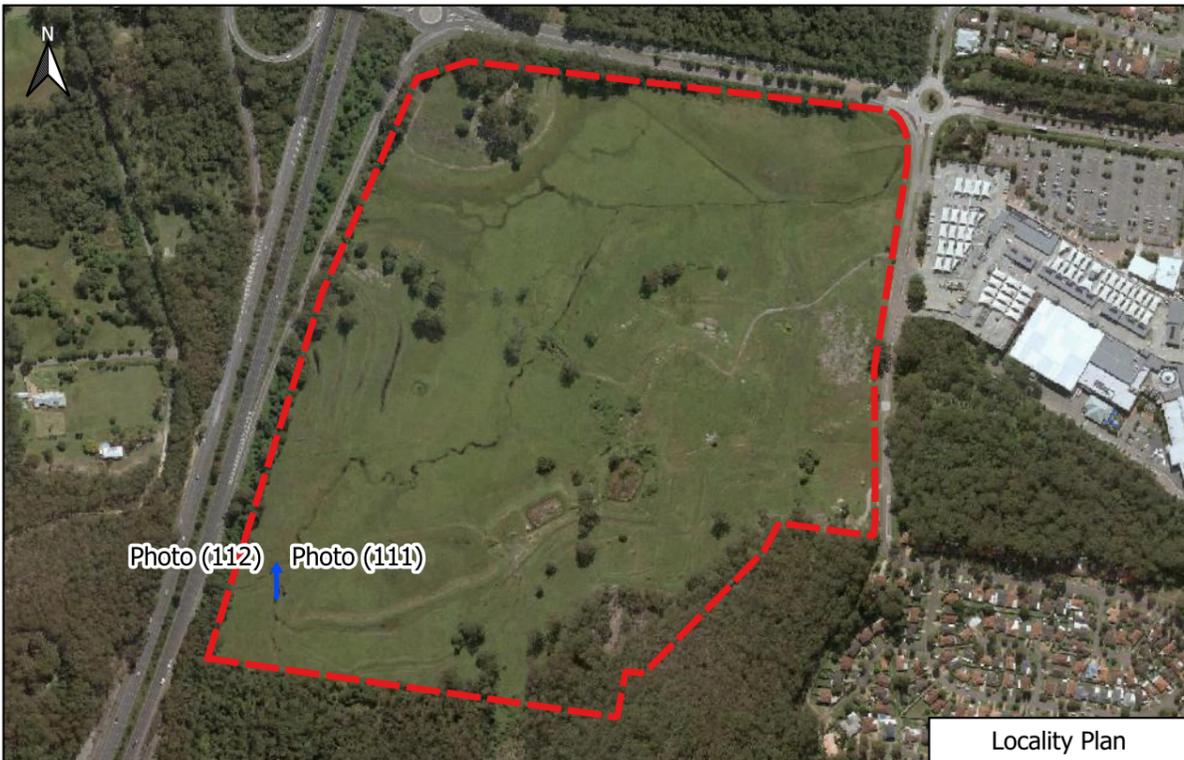


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 55

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (111)**



**Photo (112)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 56

REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (113)**



**Photo (114)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 57

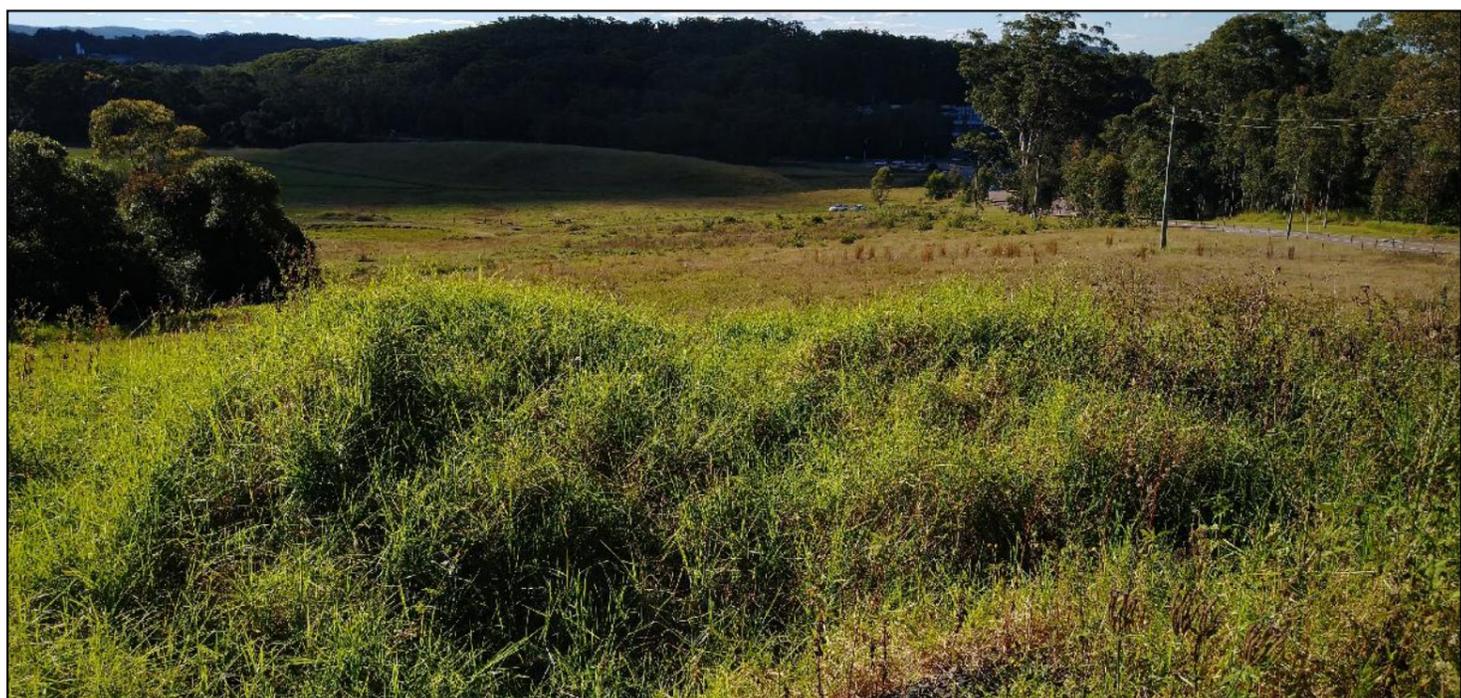
REVISION: 0



Legend  
 Approximate Photo Location / Direction



**Photo (115)**



**Photo (116)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**

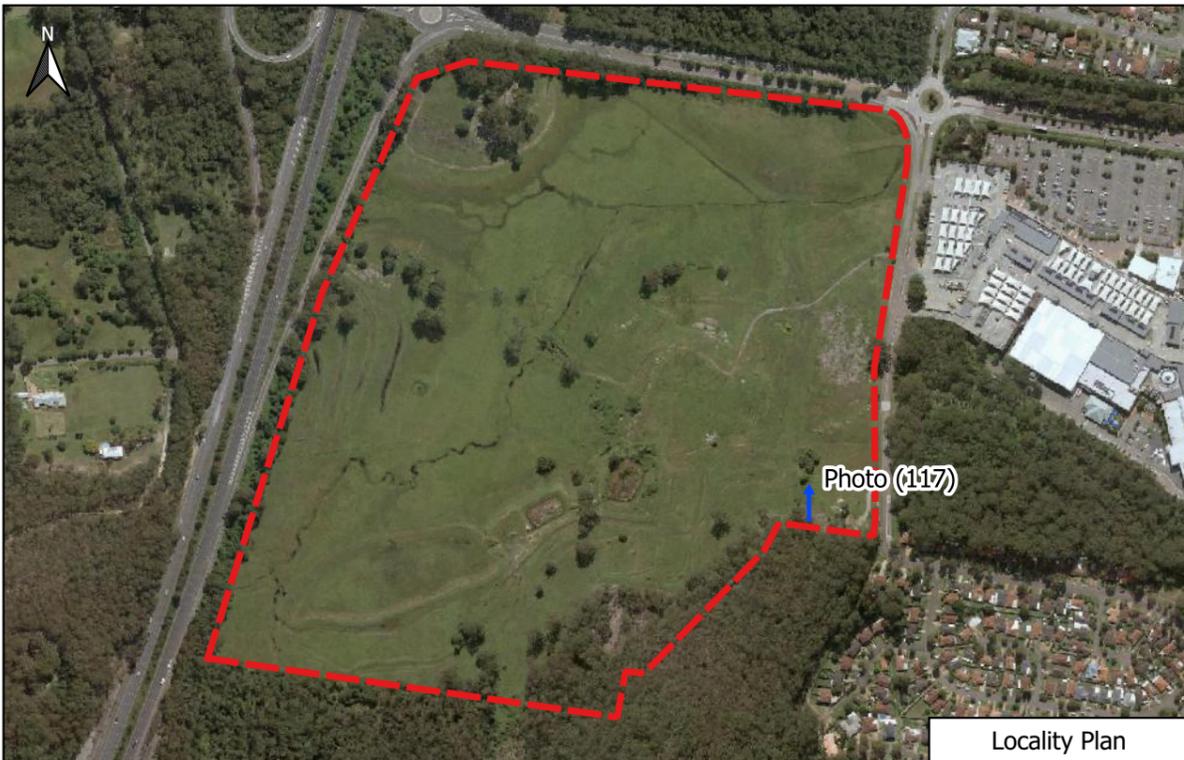


PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 58

REVISION: 0



Legend  
 ↑ Approximate Photo Location / Direction



**Photo (117)**

CLIENT: Scentre Limited

OFFICE: Central Coast

DRAWN BY: TDM

SCALE: N/A



TITLE: **Photo Plates**  
**Tuggerah Gateway Project**  
**60 Wyong Road, Tuggerah**



PROJECT No: 202794.00

DATE: 30.07.21

PHOTO PLATE No: 59

REVISION: 0